McCARTNEY LIBRARY
GENEVA COLLEGE

JULY 25, 1936

Railway Age

Founded in 1856

E-M-C DIESEL POWERED TRAINS ARE SHOWING
"ON-TIME" RECORDS OF AS HIGH AS 94%

THE ALTON RAILROAD COMPANY
CHICAGO ST. LOUIS
"The ONLY WAY"
KANSAS CITY

The "Abraham Lincoln"—crack train of the Alton—is hauled by an 1800 H.P. Diesel locomotive. . . . This luxurious train covers the distance between Chicago and St. Louis in 4 hours and 55 minutes. . . . Its passengers are provided with the last word in train appointments. . . . They are assured the smooth, rapid acceleration and deceleration and the quiet, clean and dependable operation that only E-M-C Diesel power makes possible. . . . We are gratified to announce that the patrons of this train have enjoyed "on-time" trips since the application of E-M-C Diesel power.

ELECTRO-MOTIVE CORPORATION
LA GRANGE, ILLINOIS, U. S. A.

E-M
E-M-C DIESEL POWER

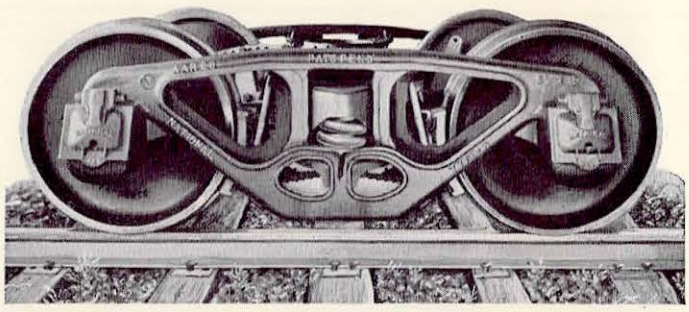
NATIONAL
TYPE B
TRUCKS

GREATEST RETURN ON INVESTMENT

THE National Truck is a superior product but not a premium product. It is doubly economical because low initial cost is followed by lower operating and maintenance costs.

Five years of trouble-free service has demonstrated that the National Truck successfully provides a simplified design with fewer parts, lighter weight, increased revenue load, increased spring capacity and permits quick low-cost wheel changes.

These mechanical and money-saving advantages are imperative for maximum return on the investment. Only National Trucks combine them all. Investigate. Details gladly furnished on request.



NATIONAL MALLEABLE AND STEEL CASTINGS CO.

General Offices: CLEVELAND, OHIO

Sales Offices: **New York, Philadelphia, Chicago, St. Louis, San Francisco**

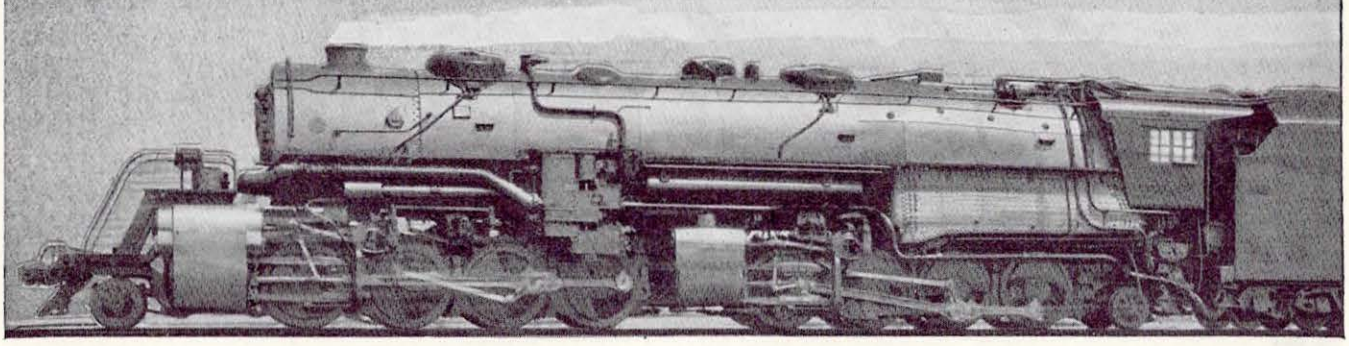
Works: **Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park Ill.**

Canadian Representatives: Railway and Power Engineering Corporation, Ltd., Toronto and Montreal

NATIONAL TYPE B TRUCKS

Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

Another case where SPECIAL PLATES *by* BETHLEHEM *solved the problem*



IN an effort to obtain plates that would improve performance and eliminate difficulty in the boiler shop a prominent eastern railroad bought a nickel steel plate from Bethlehem to replace a ruptured boiler course.

After the installation of this plate the railroad's master boilermaker said, "This Bethlehem Plate is the best I've ever seen. It worked fine. We had no trouble in handling it." Since this initial application the railroad has placed orders with Bethlehem for boiler plates for seven more locomotives of the same type.

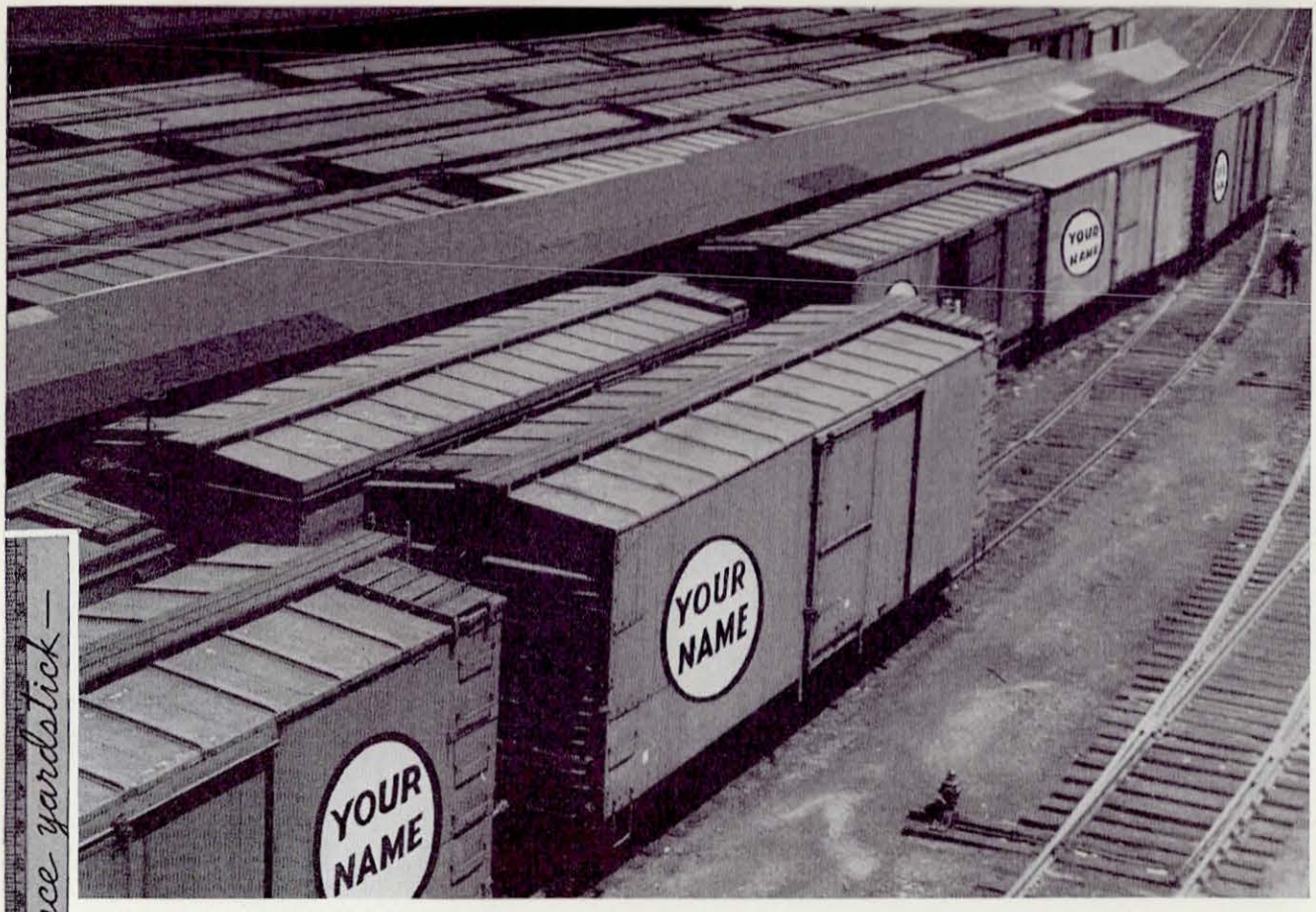
The record of this nickel steel plate is typical of results obtained when Bethlehem makes plates, whether special plates for special purposes or ordinary carbon steel plates for everyday applications.

Unsurpassed facilities and broad experience combine to make Bethlehem a highly satisfactory source for plates for every industrial requirement.

BETHLEHEM STEEL COMPANY, *General Offices:* Bethlehem, Pa. *District Offices:* Albany, Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Hartford, Honolulu, Houston, Indianapolis, Kansas City, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Portland, Ore., Salt Lake City, San Antonio, San Francisco, St. Louis, St. Paul, Seattle, Syracuse, Washington, Wilkes-Barre, York. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL



MEASURE YOUR PAINT COST BY THE *performance yardstick*—

A freight car carries

A NAME

A RAILROAD'S NAME travels far and wide in the course of a year. There are 2,000,000 freight cars to patrol the quarter million miles of railroad in the United States. The mark of the owner is displayed on each of these cars—perhaps spelled out in bold letters, or indicated by a familiar monogram. To the public, this identifying label is likely to reflect its owner's ability to serve, whether it stands out sharp and fresh or looks shabby against a faded and discolored background.

The problem has been to find an economical way to dress up these traveling representatives and keep them handsome. Du Pont has solved this problem by developing a more durable freight car paint—TUFCOTE.

Ordinary freight car paint has a tendency to fade and change color as the inert material bleaches out. But TUFCOTE has overcome this weakness in such a way that color is more uniform and lasting.

TUFCOTE saves time and money on the paint track. Its quick-drying properties make it practical to apply two coats in the same day and stencil the following morning. It comes in uniform, ready-to-use consistency, so there is no time wasted in reduction operations or mixing ingredients by hit-or-miss methods.

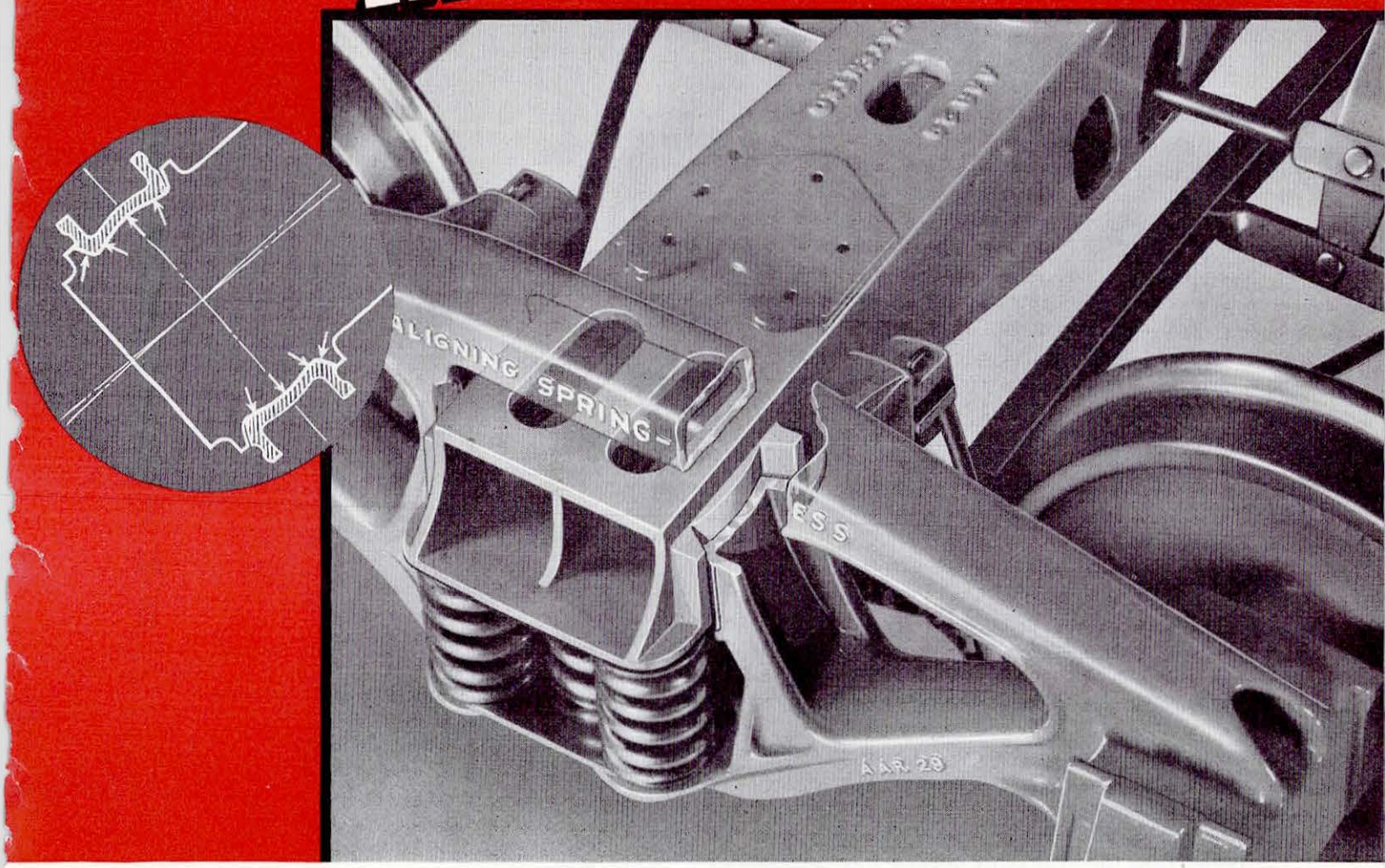
Our representative will tell you more about the money-saving features of TUFCOTE and other du Pont finishes. E. I. du Pont de Nemours & Co., Inc., Finishes Division, Wilmington, Delaware.

DU PONT
REG. U. S. PAT. OFF.

RAILWAY FINISHES

DU PONT ON THE AIR—*Listen to "The Cavalcade of America" every Wednesday evening, 8:00 p. m., E. S. T., over Columbia Broadcasting System*

Wide bearing areas insure long wear



Self-Aligning Trucks are sound and simple in design. They are the result of 35 years of development by the foremost engineers in cast steel truck construction.

THE bolster of the Self-Aligning (spring-plankless) Truck, at the point of contact with the side frame, has large cylindrical surfaces that engage corresponding areas on the frame.

Regardless of the lateral angularity between bolster and frame (limited by large radial stops), these large bearing areas are always completely in contact . . . insuring long wear, an essential factor in lowering truck maintenance costs.

Self-Aligning Trucks have the lightest weight possible . . . have the fewest parts . . . are low in cost . . . are inexpensive to maintain. Specify them.

AMERICAN STEEL FOUNDRIES
NEW YORK • CHICAGO • ST. LOUIS
Licensed Manufacturer of Self-Aligning Trucks

SELF-ALIGNING TRUCKS

spring-plankless

UTILIZE DESIGNS OF PROVED DEPENDABILITY

WHEN DROUGHT STRIKES CHINA

■ When drought strikes China, 5 million people die in their villages, cut off from food as if by an endless sea. But drought in America does not mean starvation. Though its consequences may be tragic, the victims at least have food, thanks to American railroads. For in this country when Drought stretches out its emaciated hand it means prompt dispatch of extra trains and an accelerated flow of food.

Years ago the railroads solved this problem of drought with the refrigerated freight car. And American Hair & Felt Co. and Dry-Zero Corporation assisted in the development of the refrigerator car by furnishing efficient insulation.

It is a significant fact that car engineers have selected products supplied by these affiliated companies for almost all the railroad refrigerator cars now in service.

HAIRINSUL — Standard refrigerator car insulation.

DRY-ZERO — The most efficient and lightest weight low temperature insulation known —standard for low temperature cars.

SALAMANDER — For over 30 years the standard insulation for passenger cars.

LIGHT-WEIGHT SALAMANDER — For insulating light-weight, high speed passenger cars.

CARINSUL — Made especially for insulating the letter board of passenger cars.

OZITE STANDARD HAIR FELT — Made by the genuine original platen or felted process and universally recognized as the highest standard of felted insulation.

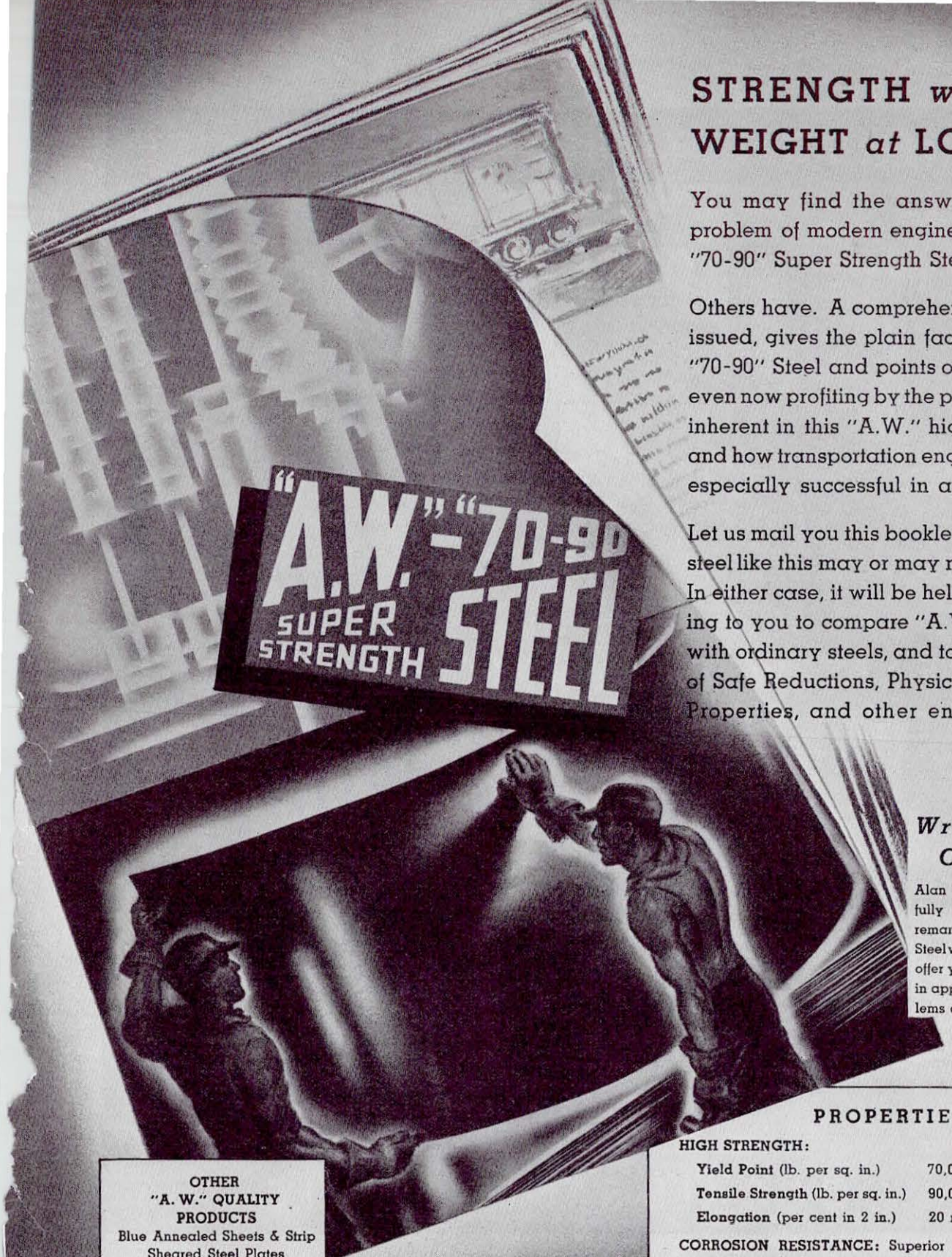
LIGHT-WEIGHT AIR CONDITIONING HAIR FELT — For insulating air ducts.

DRY-ZERO ECONOMY ICE BLANKET —For reducing ice meltage on platforms and in transit.

AMERICAN HAIR & FELT COMPANY • DRY-ZERO CORPORATION

(Railroad Division)

Merchandise Mart Chicago



STRENGTH *with* LESS WEIGHT *at* LOW COST

You may find the answer to this major problem of modern engineering in "A.W."-"70-90" Super Strength Steel.

Others have. A comprehensive booklet just issued, gives the plain facts and figures of "70-90" Steel and points out how others are even now profiting by the peculiar properties inherent in this "A.W." high tensile steel—and how transportation engineers have been especially successful in applying "70-90."

Let us mail you this booklet. Your need for a steel like this may or may not be immediate. In either case, it will be helpful and interesting to you to compare "A.W."-"70-90" Steel with ordinary steels, and to check our charts of Safe Reductions, Physical and Chemical Properties, and other engineering data.

Write For Your Copy Today

Alan Wood staff engineers are fully equipped to discuss this remarkable new Super Strength Steel with you in every detail, and offer you competent cooperation in applying it to your own problems of design and construction.

OTHER "A. W." QUALITY PRODUCTS

Blue Annealed Sheets & Strip
Sheared Steel Plates
Billets, Blooms & Slabs
"Swede" Pig Iron

"A. W." Diamond Types Rolled Steel Floor Plate

PROPERTIES

HIGH STRENGTH:	SSA	SSAA
Yield Point (lb. per sq. in.)	70,000 min.	50,000 min.
Tensile Strength (lb. per sq. in.)	90,000 min.	65,000 min.
Elongation (per cent in 2 in.)	20 min.	25 min.

CORROSION RESISTANCE: Superior to all ordinary steels.

WELDABILITY: Excellent. No treatment to prevent brittleness required.

FABRICATION: Lends itself readily to difficult cold forming and cold flanging.

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

BRANCHES: Philadelphia New York Boston Los Angeles San Francisco Seattle Houston

110 YEARS' IRON- AND STEEL-MAKING EXPERIENCE

ALAN WOOD STEEL CO. ESTABLISHED A.W. TRADE MARK 1826 CONSHOHOCKEN, PA.

ATCHINSON, TOPEKA & SANTA FE

Pattern, for an otherwise plain scheme, in modern Velmo supplied by Marshall Field & Co. Chairs by Heywood Wakefield Co.

RE-SEATS WITH BEAUTIFUL VELMO

A decorator-shade.. peach-gray Velmo from Mandel Brothers, Chicago. Seats by Coach & Car EquipmentCompany.

FROM GOODALL-SANFORD'S LOOMS

VELMO

MOHAIR VELVET UPHOLSTERY

"The Transportation Fabric of the Nation!"

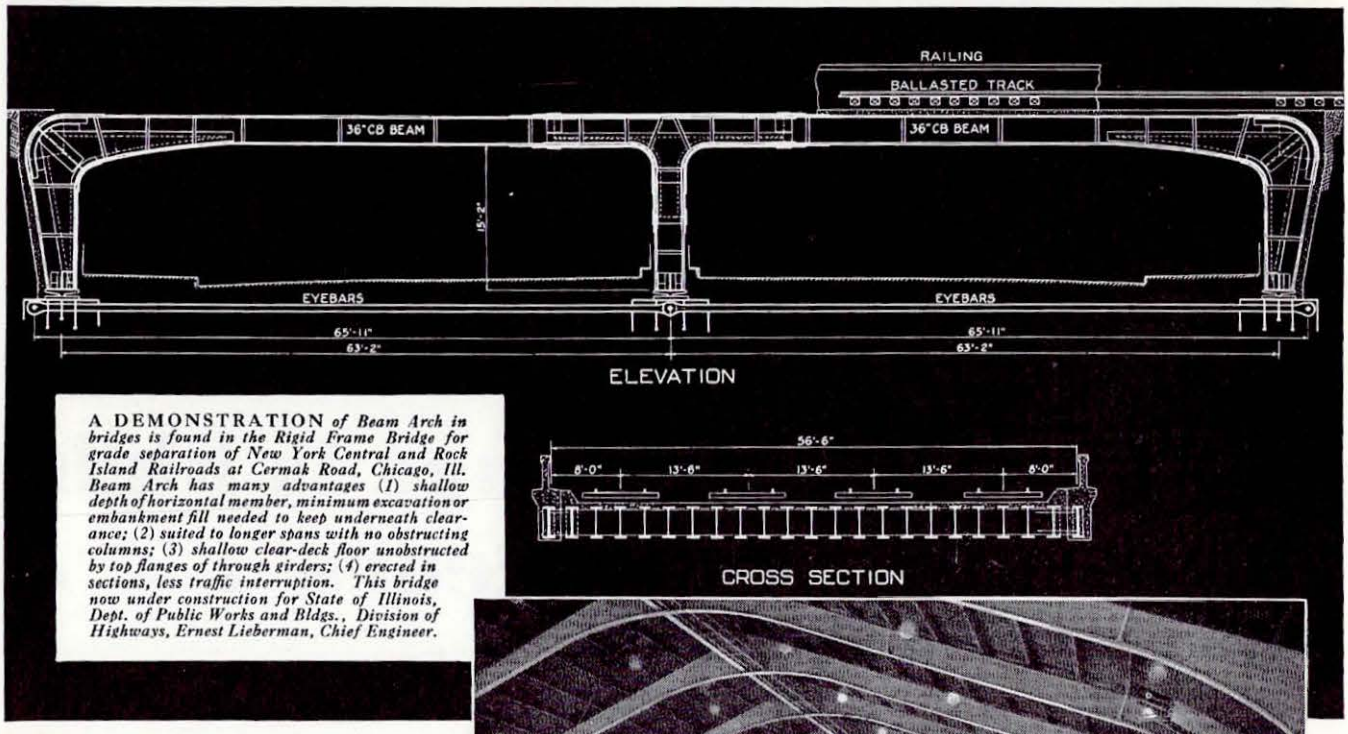
L. C. CHASE & CO., Inc., *selling division of Goodall-Sanford*, 295 Fifth Avenue, New York

BOSTON CHICAGO DETROIT SAN FRANCISCO

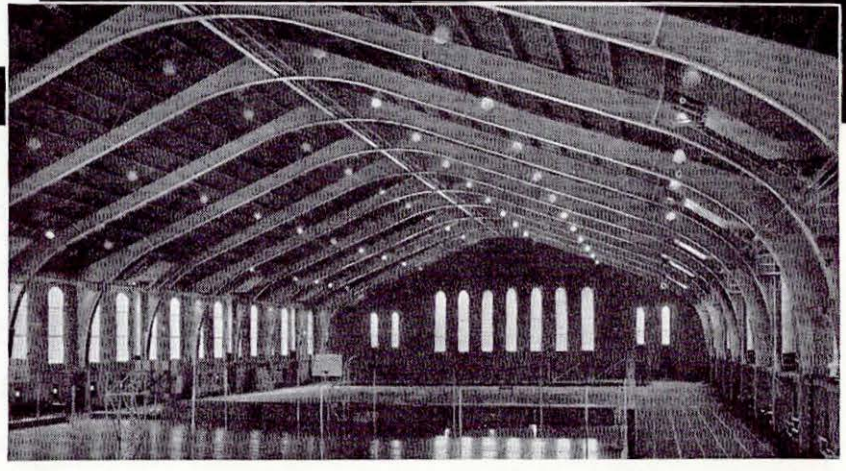
Announcing . . .

BEAM ARCH CONSTRUCTION

applied to Rigid Frame Bridge



A DEMONSTRATION *of Beam Arch in bridges is found in the Rigid Frame Bridge for grade separation of New York Central and Rock Island Railroads at Cermak Road, Chicago, Ill. Beam Arch has many advantages (1) shallow depth of horizontal member, minimum excavation or embankment fill needed to keep underneath clearance; (2) suited to longer spans with no obstructing columns; (3) shallow clear-deck floor unobstructed by top flanges of through girders; (4) erected in sections, less traffic interruption. This bridge now under construction for State of Illinois, Dept. of Public Works and Bldgs., Division of Highways, Ernest Lieberman, Chief Engineer.*



THIS FIELD HOUSE *for University of Chicago built in 1931, the first major installation of American Bridge Company Beam Arch, demonstrated the advantages for buildings—(1) long span construction (spans up to 200 feet have been built); (2) no interior posts or deep trusses, unobstructed light, ventilation and vision; (3) balconies may be cantilevered from columns, no unsightly hangers above or posts below; (4) shallow depth of arch member, lower roof line reduces height of enclosing walls. Field House is 168'2" wide, 68' high at center. Architects, Holabird & Root; Associate Architect, Emery B. Jackson.*

THE sweeping curve of roof construction and the vaulted profile of bridge spans can now use to advantage the Beam Arch as developed by American Bridge Company. In addition to its innate beauty it has many economies—it is fabricated from Carnegie-Illinois rolled CB beams; it is shipped in large sections to simplify and speed field erection; it has low maintenance costs for the large plain surfaces are easily inspected and painted, while offering no inaccessible surfaces or pockets to collect dirt.

Beam Arch construction is new and modern. It offers the ultimate in appearance, strength and economy. Call on us for additional information or suggestions.

A M E R I C A N B R I D G E C O M P A N Y

General Offices: Frick Building, Pittsburgh, Pa.

Baltimore · Boston · Chicago · Cincinnati · Cleveland · Denver · Detroit
Duluth · Minneapolis · New York · Philadelphia · St. Louis

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

Specify

WAUGH-GOULD DRAFT GEAR

Type 403

When lading damage is high look to the draft gears . . .

THE capacity and the action of the Waugh - Gould Type 403 Draft Gear minimizes the damage to ladings, an item most worthy of consideration.

Specify Waugh-Gould Type 403 Draft Gears. They have proven that they give trouble-free service over a long period of years.

WAUGH

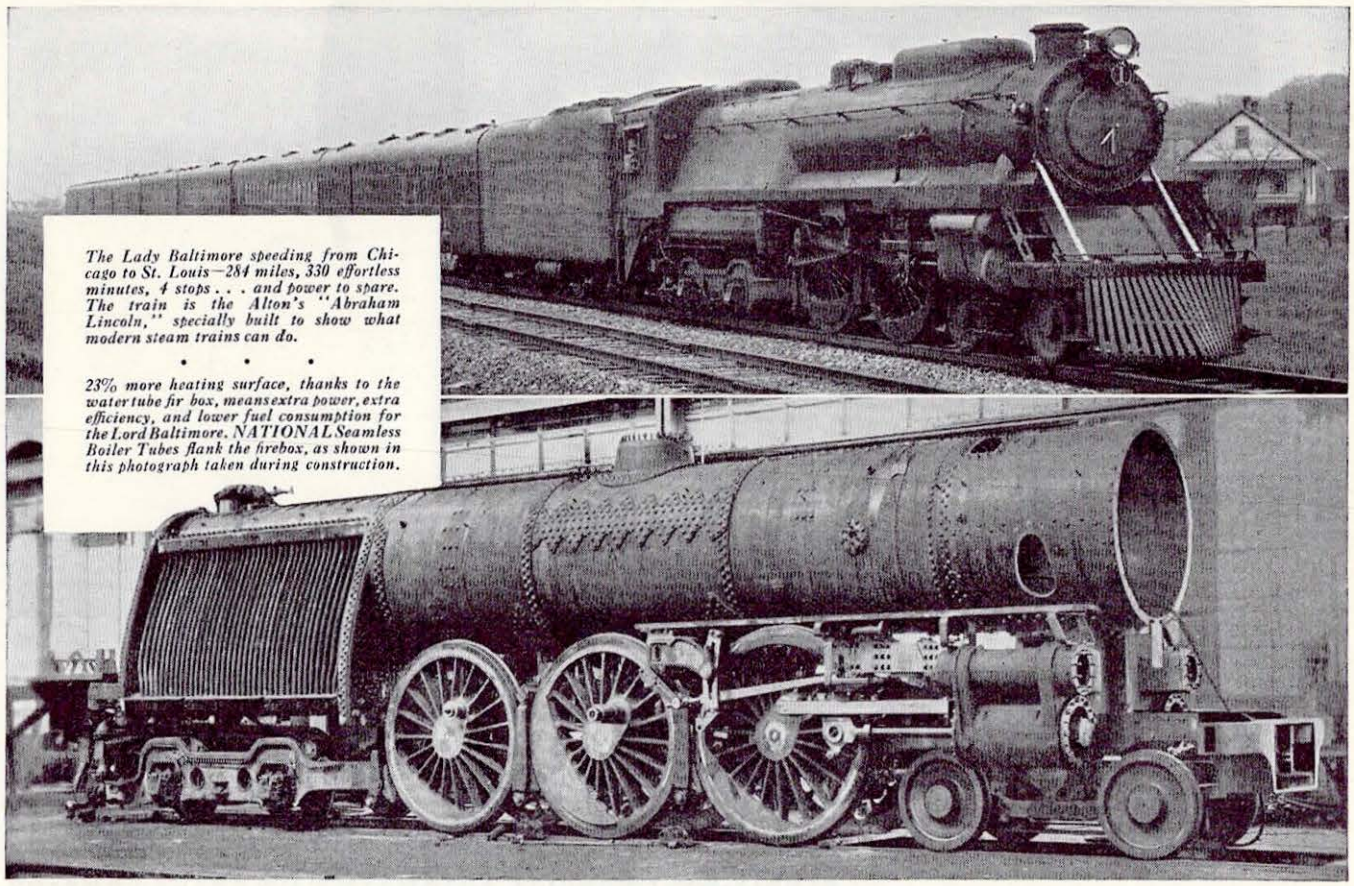
W A U G H

EQUIPMENT COMPANY

New York Chicago St. Louis

Canadian Waugh Equipment Co., Ltd., Montreal

For these Aristocrats of Locomotives . . . they chose NATIONAL *Seamless* BOILER TUBES



The Lady Baltimore speeding from Chicago to St. Louis—284 miles, 330 effortless minutes, 4 stops . . . and power to spare. The train is the Alton's "Abraham Lincoln," specially built to show what modern steam trains can do.

• • •

23% more heating surface, thanks to the water tube fir box, means extra power, extra efficiency, and lower fuel consumption for the Lord Baltimore. NATIONAL Seamless Boiler Tubes flank the firebox, as shown in this photograph taken during construction.

THERE'S an interesting story back of the Lord Baltimore and Lady Baltimore that speed the Alton's crack limited "Abraham Lincoln" between Chicago and St. Louis.

Their builders had one purpose in mind—to take advantage of the most advanced ideas in steam locomotive design and equipment — to prove beyond question that locomotive efficiency could be increased.

To accomplish this they ignored conventional specifications. Every part was subjected to rigid scrutiny before it was adopted. It had to be the best obtainable. They chose four wheel trailer boosters, roller bearings, mechanical lubrication, automatic stokers, combined fire and water tube boiler — and NATIONAL Seamless Boiler Tubes.

The result? New records for smooth, effortless handling, high boiler efficiency, low fuel consumption, low-cost-per-mile operation. As one engineer said, "There never were two engines like them. Everything about them is favorable."

NATIONAL Seamless Boiler Tubes are making two important contributions to these locomotives: increased efficiency of the combined fire and water tube boilers, plus their well known dependability and long life. — Excellent reasons for using them in your own locomotives.

NATIONAL TUBE COMPANY

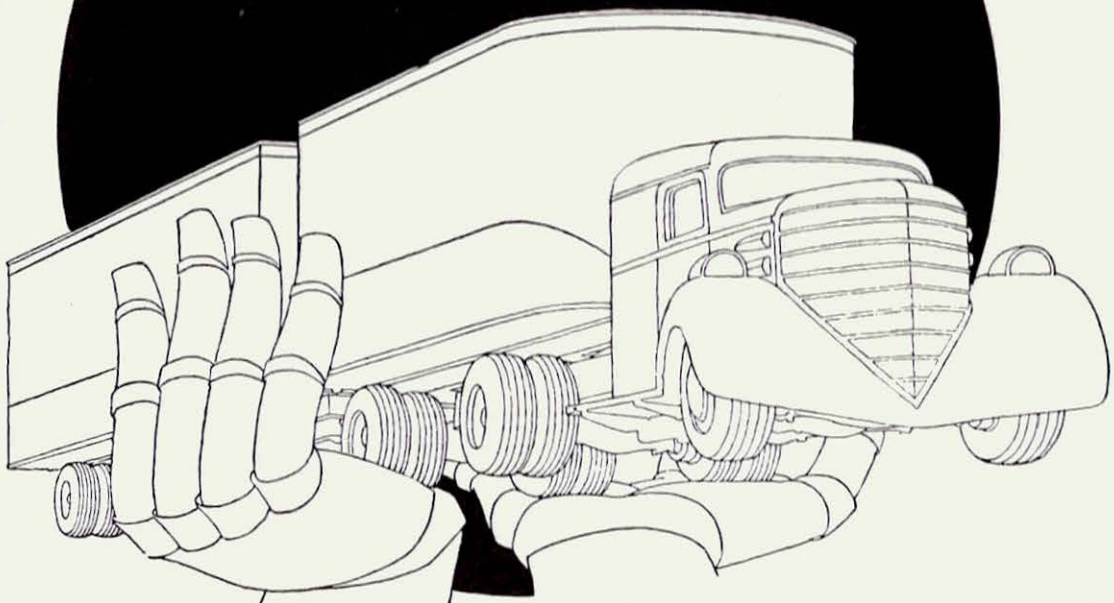
PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

THERE IS NO SUBSTITUTE FOR GENUINE WESTINGHOUSE AIR CONTROL ★ AIR BRAKES ★ AIR GEARSHIFT ★ AIR CLUTCH ★ AIR STEERING ★ AIR HORNS

YEARS OF SAFETY

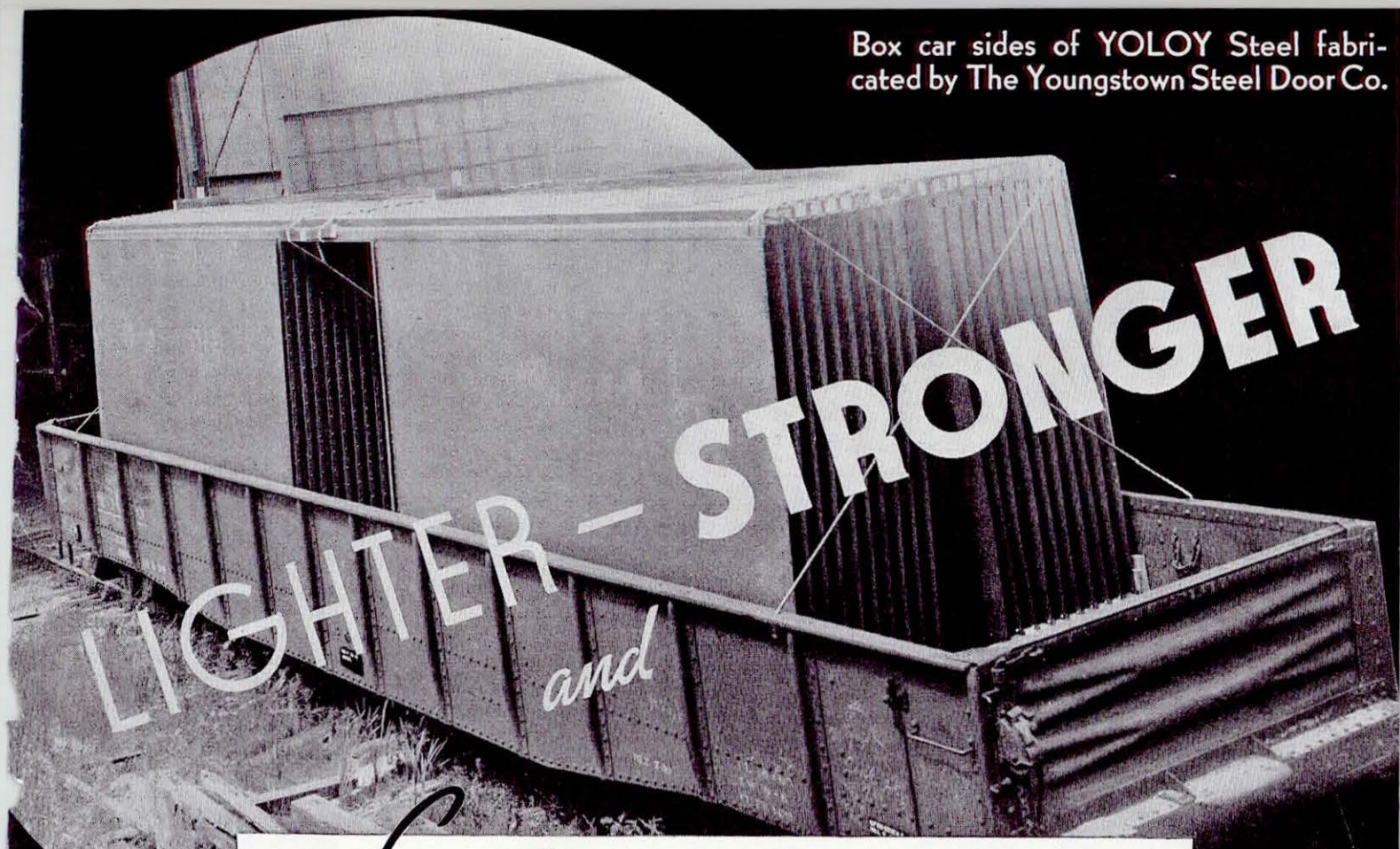


If you're inclined to give safety the careful thought and consideration it rightfully deserves as an increasingly vital factor in the modern scheme of highway transportation, you think first of genuine Westinghouse Air Brakes. Not unusual to be sure, for here is one braking system which starts from scratch by embodying all the claimed advantages of a hundred contemporary equipments and then goes on, year after year, doing a braking job as only Genuine Air can do it. Write for complete information concerning genuine Westinghouse Air Control . . . the time-tested system which actually cost less than ordinary brakes, assures effortless control under all conditions, performs its job with power to spare and whose exceptionally long life permits its subsequent re-installation and dependable service, long after the vehicle of its original installation has been replaced.

BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE COMPANY
PITTSBURGH ● PENNSYLVANIA

GENUINE WESTINGHOUSE AIR BRAKES

AS LOW AS $139.00 INSTALLED



Box car sides of YOLOY Steel fabricated by The Youngstown Steel Door Co.

• Greater CORROSION RESISTANCE

YOLOY, the nickle-copper alloy steel, produced exclusively by YOUNGSTOWN, makes possible a minimum of 25% reduction in dead weight of passenger cars, coal cars, box cars and other rolling stock, at the same time providing a stronger structure. The resistance of YOLOY to atmospheric corrosion assures a life of four to six times that of mild carbon steel.

Write for complete YOLOY bulletin

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices - YOUNGSTOWN, OHIO

YOLOY TRADE MARK YOUNGSTOWN STEEL

HIGH-TENSILE STEEL
YOLOY

is available in sheets, strip, plates, bars, shapes, manufacturers and welding wire, seamless and electric weld pipe.

629

YOUNGSTOWN

REDO OFFERS

FLEXIBILITY —*ease and softness in handling*

STRENGTH —*tremendous resistance to abrasion and flexing*

APPEARANCE—*attractive colorings in popular grains*

VARIETY —*solid or two-tone Spanish effects*

REDO UPHOLSTERY is a specially constructed material built for wear, appearance and economy. Redo can be used wherever a rugged, wear-resistant, weather and time defying material is required—for both deep spring furniture upholstery and transportation seating. The tough, flexible coating of Redo is resistant to abrasion or flexing and provides those qualities which insure the most exacting service.

Redo

UPHOLSTERY

A *Goodall-Sanford* PRODUCT

L. C. CHASE & CO., Inc., selling division of Goodall-Sanford, 295 Fifth Avenue, New York

BOSTON CHICAGO DETROIT SAN FRANCISCO

Published every Saturday by the Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa., with editorial and executive offices: 30 Church Street, New York, N. Y., and 105 West Adams Street, Chicago, Ill.

SAMUEL O. DUNN, *Chairman of Board*
HENRY LEE, *President*
LUCIUS B. SHERMAN, *Vice-Pres.*
CECIL R. MILLS, *Vice-Pres.*
ROY V. WRIGHT, *Vice-Pres. and Sec.*
FREDERICK H. THOMPSON, *Vice-Pres.*
ELMER T. HOWSON, *Vice-Pres.*
F. C. KOCH, *Vice-Pres.*
JOHN T. DEMOTT, *Treas.*

CLEVELAND
Terminal Tower

WASHINGTON
832 National Press Building

Editorial Staff
SAMUEL O. DUNN, *Editor*
ROY V. WRIGHT, *Managing Editor*
ELMER T. HOWSON, *Western Editor*
H. F. LANE, *Washington Editor*

B. B. ADAMS
C. B. PECK
W. S. LACHER
ALFRED G. OEHLER
F. W. KRAEGER
E. L. WOODWARD
J. G. LYNE
J. H. DUNN
D. A. STEEL
R. A. DOSTER
H. C. WILCOX
NEAL D. HOWARD
CHARLES LAYNG
GEORGE E. BOYD
WALTER J. TAFT
M. H. DICK

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).

Subscriptions, including 52 regular weekly issues, payable in advance and postage free; United States and possessions, and Canada, 1 year $6.00, 2 years $10.00; foreign countries, 1 year $8.00, 2 years $14.00.

Single copies, 25 cents each.

Address H. E. McCandless, Circulation Manager, 30 Church Street, New York, N. Y.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered U. S. Patent Office

Vol. 101 July 25, 1936 No. 4

In This Issue

Co-ordinator's Report on Train and Engine Wage Basis..... Page 135

An editorial appraisal of this document, the basic data of which are found to substantiate the criticism of the present wage basis on every fundamental point.

New Brake-Shoe Testing Machine in Sargent Laboratory..... 138

A description of this device, developed by the American Brake Shoe & Foundry Company, which approximately doubles brake-shoe and wheel-load capacity and greatly increases speed range.

New Haven Bus and Truck Subsidiaries Work Together..... 150

A Motor Transport Section article telling how inter-company co-operation and services received from the railroad bring operating economies.

EDITORIALS

The Co-ordinator's Report on the Train and Engine Wage Basis..... 135
Freight Loadings During Six and One-Half Years..... 136

GENERAL ARTICLES

New Brake-Shoe Testing Machine in Sargent Laboratory..... 138
Freight Car Loading..... 140
Air Brake and Signal Companies Elect Officers..... 141
Wood Preservation Gains 16 Per Cent in 1935..... 142
Suggests Electrification on 20 Railroads..... 143
Huge Parades Climax Railroad Week..... 145
Railroad Construction Indices for 1935..... 146
Rock Island Plan of Reorganization..... 147
Eastman May Not Use Unexpended Funds..... 148

MOTOR TRANSPORT SECTION

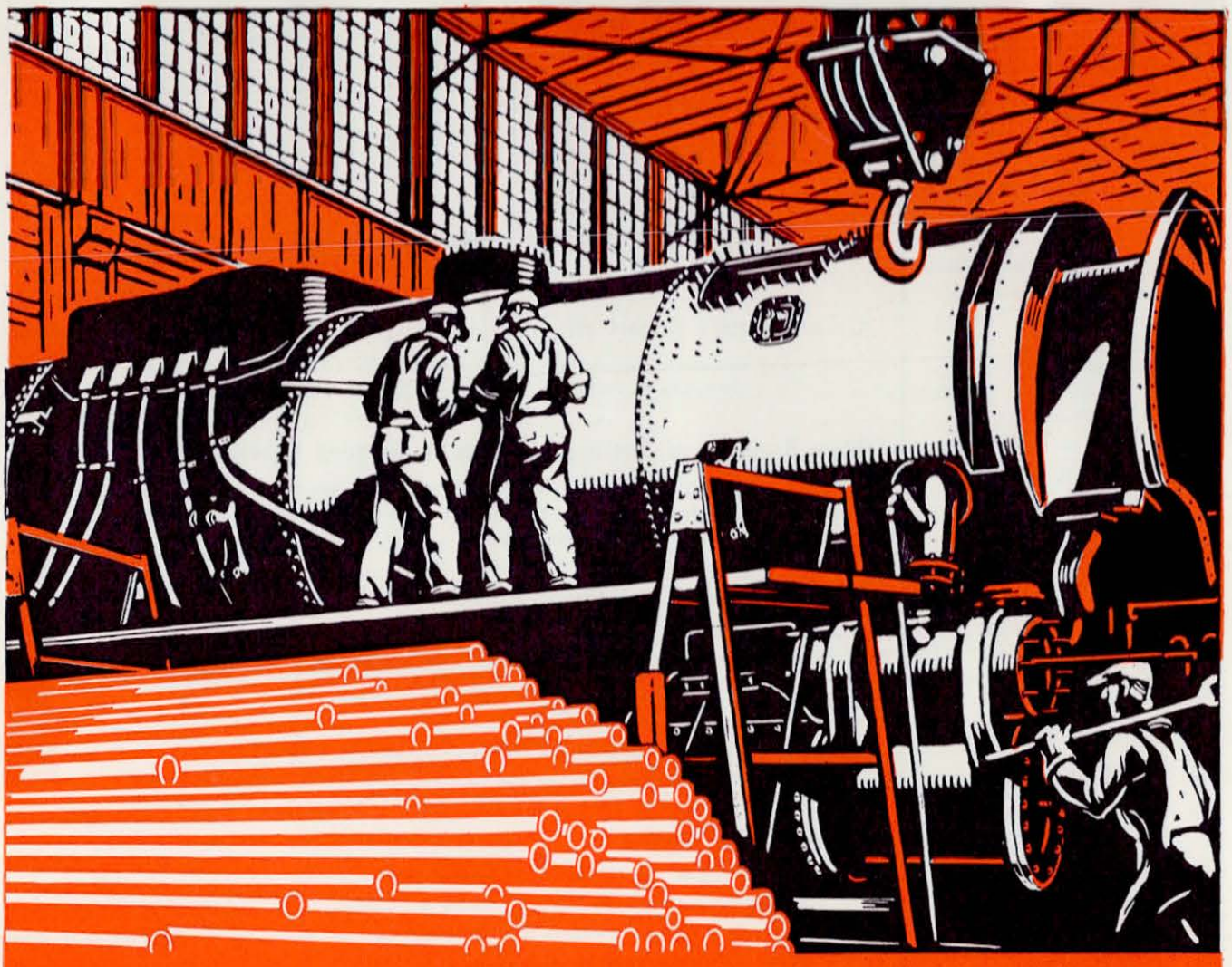
New Haven Bus and Truck Subsidiaries Work Together..... 150
Rail-Highway-Ship Co-ordination in New Zealand..... 152
Winning Back Merchandise Traffic..... 153
Local Truckers Propose Unified Pick-up Plan..... 154
A New Type of Container..... 155
Bureau of Motor Carriers Showing Increased Activity..... 156
"I Drive Safely"..... 157
National Trailways Builds Terminals..... 157

NEWS 158

OPERATING REVENUES AND EXPENSES..... 166

FREIGHT OPERATING STATISTICS..... 167

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service



A MODERN LOCOMOTIVE UNIT Uses Over 2,000 Feet of Pipe

Over two thousand feet of pipe are used on a modern locomotive for steam, air and water. This pipe must resist corrosion on the outside and the action of water, air or steam under pressure on the inside. It must withstand constant vibration. It must not fail. » » » Toncan Iron Pipe is an alloy specially suited for this service. Refined iron, copper, and molybdenum give it high corrosion resistance, sustained strength and high resistance to vibration fatigue. It threads perfectly and is corrosion-resistant throughout. » » » In this important service Toncan Iron Pipe not only insures long life and dependability of performance but also guarantees maximum economy of service. » » » We will gladly send further information on request. Address Dept. RA. » » » » » » »

REPUBLIC STEEL

Republic Steel CORPORATION

GENERAL OFFICES: CLEVELAND, OHIO

REPUBLIC BOLTS NUTS and RIVETS and similar staples are made with the same care and high quality of material as are the familiar Republic railroad specialties.

RAILWAY AGE

The Co-ordinator's Report on the Train and Engine Wage Basis

Recently, with considerable publicity in the daily press, the Co-ordinator issued a report by his section of labor relations on rules governing wage payments in train and engine service. That part of this report which reached the public was largely restricted to the general conclusions of the director of the section belittling any unfavorable effects of these rules and including his opinion that money earned in excess of hours actually worked in train service "cannot fairly be considered a payment for time not worked. It is payment for service rendered, and is proportionate thereto."

Critics of the "hours and/or mileage" basis of payment in train and engine service have alleged that, whereas increased train speed has been the result of the co-operation of the entire railroad organization plus the investment of large sums of capital in improvements, the present basis of payment has deflected the benefits of higher speed largely to train and engine employees by shortening their hours of labor. The summary of the study of the section of labor relations, as it appeared in the daily press, clearly conveyed the impression that the report had weighed this criticism and found it unfounded. But the factual data in the report, as distinguished from the opinions, do no such thing. In them, on the contrary, will be found ample substantiation of all that the critics have charged.

"Constant Increases" in Pay for Hours Not Worked

By diluting and oversimplifying the nature of the criticism and thus setting up a straw man which it proceeds to demolish with ease, the section of labor relations has managed to whitewash a situation which, on the evidence of its own report, plainly calls for a remedy. For instance, the report shows that the difference between what was paid in straight time compensation and what straight time compensation would have been for hours actually worked was approximately $61,000,000 in 1933, $66,000,000 in 1934 and $74,000,000 in 1935. To quote: "In 1923 the difference amounted to 7.5 per cent of the payroll (in train and engine service). In 1932 and 1933 it was 15 per cent, in 1934, 16 per cent. Existence of the difference and its constant increase in proportion to the pay roll appear to be chiefly responsible for the claim that train and engine service employees are paid for many hours during which they do not work."

A large part of the critics' argument is conceded in the words "constant increase" in the above quotation. It may, of course, be granted that a mileage basis of wage payment is comparable to "piece work," and hence is justifiable. But who ever heard of a factory working on piece work which would spend millions on improved machinery, and gear up its whole organization to faster production with its new machines—and then maintain exactly the same basis of piece work payments in the modernized plant as it had in the old? Yet that is exactly what is happening on the railroads by the maintenance of "piece work" based on the hourly performance ratio established almost 20 years ago.

Why Include Yard Service Employees?

The report says further that "any system of wage payment by results has similar effects over a period of time," but it neglects to cite any other industry which has been remachined and where the same rate of output per man is scheduled with new machines as with the old. The director of the section of labor relations was a man skilled in shop practice. The analogy of railroad train service today, compared with that of the war years, with that of an old machine shop which has been completely re-equipped is obvious. He saw the resemblance of mileage rates to piece work all right, but thereupon his faculty of induction went dead on him. He dared not pursue it further, else it would have led him inevitably to the conclusion that, a diesel streamliner being a faster machine than the Podunk Accommodation, the piece work rate on the two should not be the same. Such an analogy would contain the substance of the criticism of the present basis of train and engine service wage payments; and the report carefully refrains from drawing it.

In the quotation the report gives the excess of mileage payments over hourly payments at 16 per cent of the payroll for 1934. That modest percentage has been attained by the device of *including in the totals employees in yard service as well as train service.* Since yard employees are paid on a basis of hours and not miles, there is no justification for including them in a total upon which the relative importance of excess mileage payments is based. Their inclusion does serve the purpose, however, of diluting the percentage and making it appear less important than it is. The report includes an intensive study of the figures for the month of March, 1934, and one table discloses

that, in that month, almost 26 per cent of the total compensation of road passenger employees and more than 20 per cent of that of freight employees was composed of these "excess equivalent hours," whereas for that month these "excess equivalent hours" for all train and yard men accounted for but a little over 11 per cent of their total wages.

The report is based almost entirely on averages, which means that cases of excessive hourly earnings are not disclosed, being pulled down by the earnings of those employees who are paid by the hour, straight time. The criticism of the present basis of payment frequently takes the form of a statement to the effect that, whereas most railway employees work eight hours a day for their pay, some train and enginemen are earning their day's wages in three or four hours or less. A really searching inquiry into the validity of such criticism would have required a frequency distribution, showing the percentage of each class of employees who were earning their day's pay respectively in 8, 7, 6, 5, 4, 3 and 2 hours or less.

The section of labor relations was also charged with the duty of making a study into comparable wages paid in competing motor transport. It found nothing to criticize in the practice of calling 100 miles a day's work in railroad freight service, although its researches must have disclosed to it the fact that easily twice this mileage is expected for a day's pay by the majority of motor carriers. Neither is there given any information as to the important bearing on the mileage wage basis of the rapidly growing inauguration of passenger train services operated at 60 miles an hour or more. No one would contend that on such runs an engineman should be required to work eight hours every day, or anything approaching it. But wherein is the work of trainmen on such runs so intensified by the higher speed as to justify a reduction in their working day of, say, 25 per cent or more?

Maintenance of way employees, yard employees, hostlers, clerks, shop forces—to say nothing of railway investors—all have helped to make these faster trains possible. When it comes to passing around the benefits of the improved speed by reducing hours—which means more pay per hour actually on duty—why is it that only one class of labor is favored? The report of the section of labor relations does not answer that question.

In drawing attention to some of the pressing questions which the report does not answer, we should not like to convey the impression that it is by any means an uninteresting or useless document. It contains much of value, including some facts probably not widely known even among all railroad men. We quote a paragraph:

* * * Baggagemen were paid [extra] compensation for loading newspapers and for transferring milk. Passenger trainmen were paid [extra] for collecting tickets. Train crews drew extra pay for handling freight cars on passenger trains, and for taking train orders over the telephone. Crews of freight trains were paid [extra] for doubling hills and doubling in and out of yards, and for watering livestock, filling water cars en route, and unloading freight at terminals. Work-train crews were paid [extra] for handling air dump cars and for flagging on account of construction work. Firemen drew allowances for filling water tanks en route, sanding motors, pulling down, shoveling over and passing coal, and cleaning fires en route. Allowances were paid, also, for washing locomotive boilers, repairing locomotives at outlying points, repairing motors, watching engines on account of derailments and in work-train service, changing engines, both in the yard and on the road, and transferring tools and supplies between cabooses.

It is fortunate for true understanding of the problem that this statement was not included in the summary upon which the reports in the daily press were based. If it had been, some lay observers might have wondered just what work *is* required, besides riding the trains, that does not involve extra compensation. Such an impression would have been misleading—but not one whit further away from the facts than the implication in the summary of the report which reached the public, to the effect that the study explodes the criticism which has been leveled at the present basis of mileage payment in train and engine service. The basic data in this report, as distinguished from the sophistries inferred from them, substantiate the criticism of the present wage basis on every fundamental point. We can understand Mr. Eastman's approval of the study only in the light of the extraordinary pressure of work which must have fallen to him during the last weeks of his functioning as Co-ordinator.

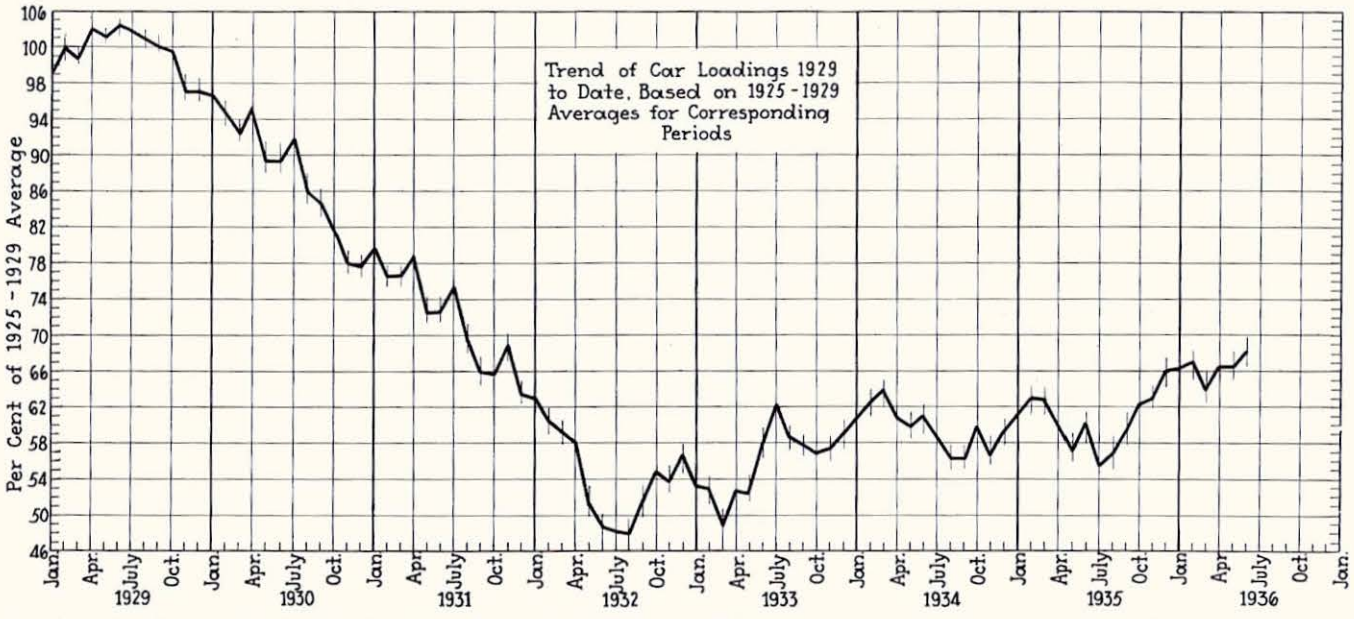
Freight Loadings During Six and One-Half Years

The accompanying graph probably shows better the changes that have occurred in the total volume of all business done in the United States within the last six and one-half years than could be shown by any other single means. It is based upon the month-to-month changes that have occurred in railroad loadings of freight from the beginning of 1929 to the end of June, 1936, with seasonal fluctuations eliminated. Average loadings in each month of the five years 1925-1929, inclusive, are taken as 100 per cent. The line shows what percentage loadings were in each month after 1928 of what they averaged in that month in 1925-1929.

The volume of freight handled by railroad since 1928 has been affected by water and truck competition. It was, however, affected by this competition some years prior to the beginning of the depression. Therefore, if all the freight transported by all carriers during the depression, instead of merely that transported by railroad were including in the computations on which it is based, the line probably would not be appreciably different. Virtually all business is done to produce, exchange and transport commodities. The volume of freight moved during any month or period is the best single measure of the total volume of all production, exchange and distribution of commodities, whether products of agriculture, forests, manufactures, or mines, and whatever their source, destination or purpose.

Therefore, complete data regarding the movement of freight are the best single measure of the total volume of business done.

It will be noted that the line reached its highest peak in June, 1929, when railroad loadings were 104.5 per cent of the average for June 1925-1929. In other words, the decline in the total volume of business done actually began four months before the stock market collapsed in October, 1929. The decline accelerated after the stock market collapse, and was virtually continuous until August, 1932, when railroad freight loadings were only 48 per cent of what they had averaged in August, 1925-1929. There then began and continued for four months through December, 1932, the first substantial increase in railroad loadings since 1929. This was followed by a sharp decline during the banking crisis in the first quarter of 1933 until in March loadings were 48.6 per cent of the 1925-1929 average.



It often has been said that the bottom of the depression was reached in March, 1933. As the chart shows, it actually was reached seven months before, loadings having been relatively smaller in August, 1932, than they became in March, 1933.

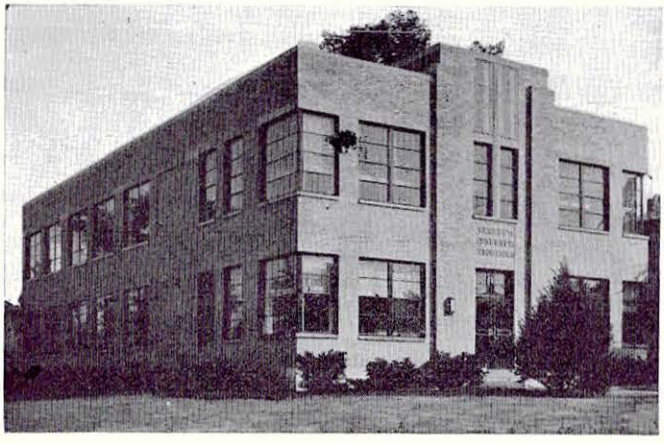
After the banks were reopened there occurred, as the graph shows, the second increase in railroad loadings of the depression, which began in April, reached its peak in July, 1933, and made them in that month 62.3 per cent of the 1925-1929 average. During the two years July, 1933, to July, 1935, freight loadings fluctuated within a narrow range, never being more than 63 per cent of the prosperity level nor less than 55½ per cent of it, this lowest level of the two years being reached in July, 1935. After two years of "recovery" under the New Deal freight loadings were 11 per cent less in July, 1935, than in July, 1933.

Since July, 1935, there has occurred the most steady and prolonged advance in loadings during the depression. The increase of four months in the latter part of 1932—allowing for seasonal variations—was 18 per cent. That of four months during April-July, 1933, was 28 per cent. That which began in August, 1935, had continued eleven months at the end of June, 1936, and had amounted to 23 per cent. It started from a higher level, than the increases in 1932 and 1933, and made loadings in June 68.1 per cent of their average in June, 1925-1929. This was relatively the highest level reached in any month, as the graph shows, since November, 1931. NRA was in effect almost throughout the two years July, 1933, to July, 1935, when the fluctuations were within a narrow range and loadings had no definite trend. The eleven months' almost unbroken increase that has subsequently occurred has all been since the decision of the Supreme Court destroying NRA.

The most important and significant fact about the recent upward trend, as compared with the increases that previously occurred, is that it has lasted so long and is still continuing. In the first two weeks of July freight loadings were 72.2 per cent of the 1925-1929 average, or almost as large, both relatively and absolutely, as in July, 1931. If their recent trend continues they will be substantially larger during the second half of 1936 than during the second half of any year since 1930. The peak month of freight movement is October. If loadings should continue only relatively as large as they were in the first two weeks of July —in other words, if they should make no more than a seasonal increase during the summer and fall months —they would average more than 833,000 cars a week in October. This would make them in October 74,000 larger weekly than in 1931; 199,000 larger than in 1932; 175,000 larger than in 1933; 200,000 larger than in 1934; and 112,000 larger than in 1935.

The railroads have ordered more new freight cars thus far this year than in any year since 1930, but the possibility of shortages of some kinds of equipment this fall is not remote. The number of surplus freight cars in the first two weeks of June was only 191,000. This compares with a surplus of 274,000 in 1935 and 626,000 in 1931, and was, in fact, the smallest surplus reported for the first one-half of June in any year since 1923.

New Brake-Shoe Testing Machine in Sargent Laboratory



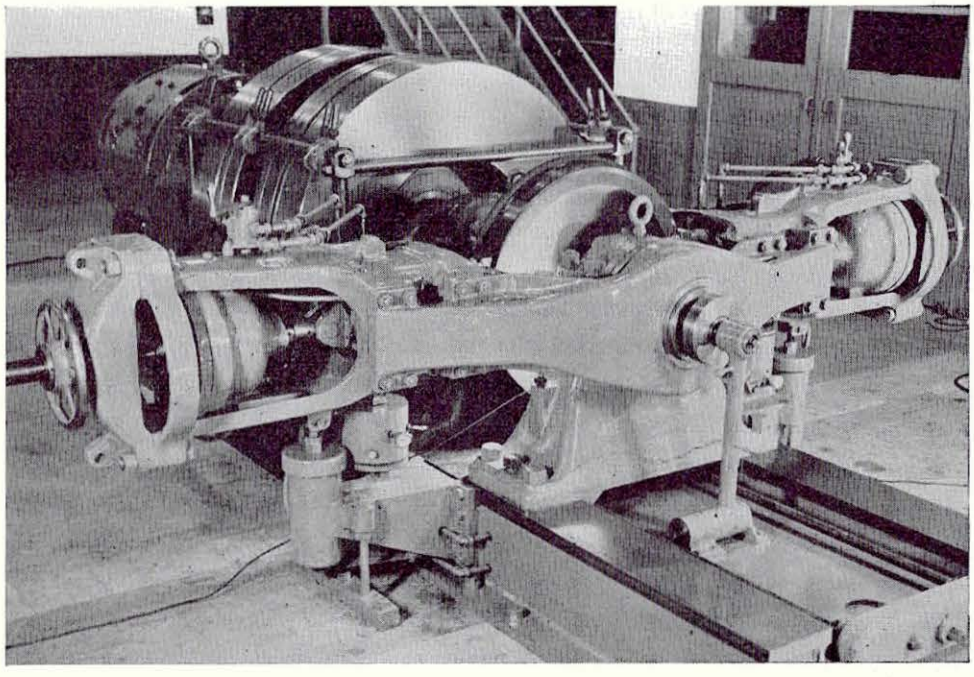
Sargent Research Laboratory of the American Brake Shoe & Foundry Company at Mahwah, N. J.

Developed by American Brake Shoe & Foundry Company, it approximately doubles brake-shoe and wheel-load capacity and greatly increases speed range

A NEWLY designed brake-shoe testing machine has recently been placed in service by the American Brake Shoe & Foundry Company. This machine, installed in the new Sargent Research Laboratory at the Mahwah, N. J., plant of the company, has a capacity for wheel loads, brake-shoe pressures and speeds which more than cover the entire range of service conditions likely to be met for many years to come. This machine replaces one of similar type but of smaller capacity which has long been used both by this company in its own development work and by the railroads as well.

The new machine, like the old, employs the rotating-ring type of loading. It is equipped with seven rings of various weights which may be arranged to give 26 combinations of wheel loads, varying from a minimum of 4,000 to a maximum of 40,000 lb. The old machine, equipped with six identical rings, provided for only seven load combinations, ranging from 6,000 to a maximum load of 20,000 lb. Braking loads of 40,000 lb. per brake head, or 80,000 lb. on the wheel with two brake heads, can be applied, an amount per brake head just double the capacity of the single brake head of the old machine. Based on a wheel of 33 in. in diameter, the new testing machine can be operated up to 150 m.p.h., whereas the top speed for the old machine was 85 m.p.h. The machine is driven by a 175-hp. electric motor which has sufficient power to permit drag tests equivalent to the braking of a train down a 4 per cent grade, a condition which it was impossible to reproduce on the old machine.

The new machine, like the old, consists essentially of a shaft or mandrel on which are mounted discs to which one or more of the loading rings may be bolted to secure



High - Capacity Brake - Shoe Testing Machine Developed by the Engineering Staff of the American Brake Shoe & Foundry Company

the energy-storage condition called for by the wheel load to be simulated. Rings not in use rest on ways on the foundation of the machine and are secured at four points by dogs mounted on horizontal bars of a rigid frame supported from the foundation. Both sides of the loading section of the shaft are supported in large SKF roller bearings which are capable not only of supporting the heavily loaded shaft, but also the heavy brake-shoe reaction when a single shoe is being tested.

The motor, which is mounted beyond one of these bearings, drives the shaft through an over-running clutch which permits the armature to be disconnected from the load before the brake is applied. This is an improvement in accuracy as compared with the old machine in which the motor armature was permanently connected to the shaft.

The car wheel, which may be from 17 in. to 42 in. in diameter, is mounted on the other end of the shaft between two large roller bearings. At each side of the wheel is an arm which supports the braking mechanism, consisting essentially of an air cylinder, crossheads and the brake head, with means for adjusting the position of the brake head to suit the diameter of the wheel and thickness of shoe being tested. These arms are suspended on ball bearings mounted concentrically about the extension of the outer bearing housing. The weight of each arm is balanced by a coil spring in a case below the arm which is supported from the foundation of the machine.

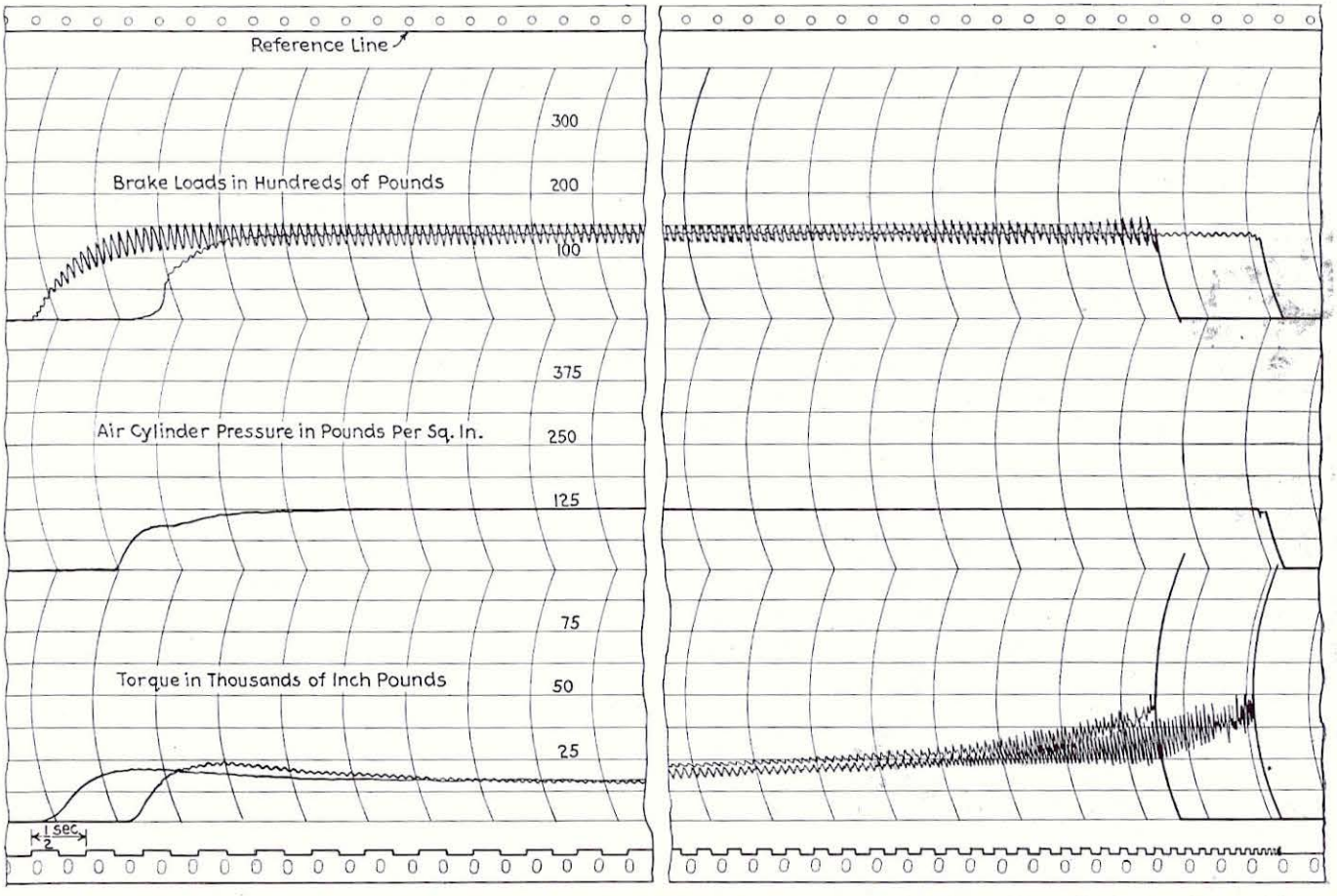
Both the brake-shoe pressure and the torque are measured by hydraulic cells. The cells for measuring brake-shoe pressure are mounted behind the brake head so that the effect of friction developed at the crosshead between the air cylinder and the brake head is eliminated. The torque cells are mounted underneath, the side arms, 36 in. from the axis of suspension.

The Controls

The operation of the machine and measurements of cylinder pressure, brake-shoe force and torque are centralized in a single control cabinet. On this cabinet are mounted gages equipped with set needles, by the adjustment of which the brake-cylinder air pressure is automatically regulated for a full application of the brake. Large gages on the control cabinet indicate the load on one brake shoe and the torque reaction caused by the friction of the brake shoe on the wheel. The cabinet is also equipped with a gage showing revolutions per minute on a coarse scale and a special type of stroboscope which indicate accurately the instant at which a predetermined speed is attained.

The motor control is effected automatically through relays from switch handles on the front of the cabinet. When, at approximately but slightly above the correct speed, the power is cut off from the motor, it is stopped by a dynamic brake. Automatic protection is provided against over-speed, over-load, and a dead line.

The air system includes an air compressor and receiver capable of continuous operation at pressures of 500 lb. per sq. in., an equalizing reservoir, the pressure regulators, control valve and air cylinders for applying the load to the shoes. Both 12-in. and 6-in. cylinders are provided, the latter for use when shoe loads do not exceed approximately 14,000 lb. The use of high air pressures permits a high degree of accuracy in the control of the shoe loads, air pressures in the cylinders

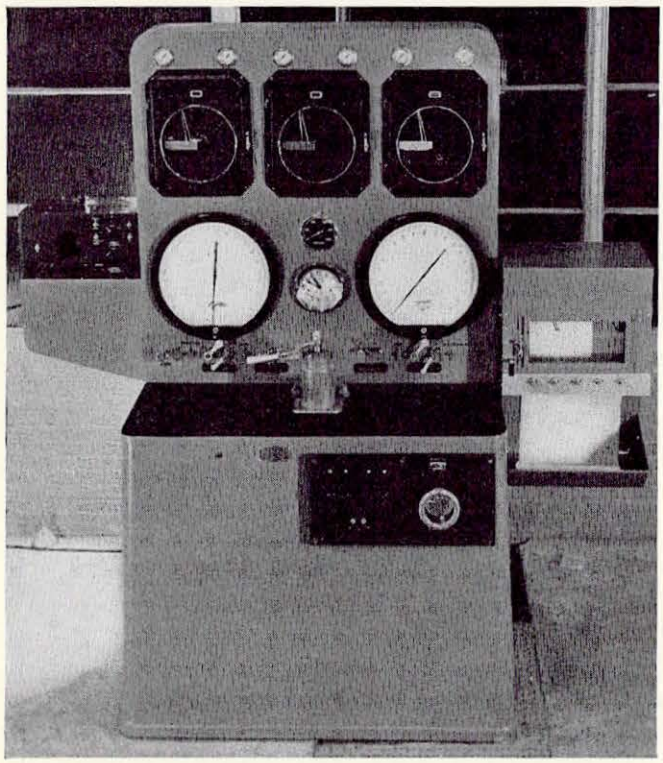


Record of a Stop of a 36-In. Wheel with Clasp Brakes—Wheel Load, 27,500 Lb.; Pressure on Each Brake Shoe, 13,750 Lb.; Time of Stop, 38 Sec.; Stopping Distance, 3,020 Ft.

being controlled to plus or minus one-half pound, with a corresponding shoe load accurate to 1 per cent. The brake valve operates the same as the familiar engineer's brake valve, permitting partial or full service applications or an emergency application as desired.

The control cabinet is fitted with a recorder having seven pens, one for each brake shoe and each torque arm, one for brake-cylinder pressure and one for recording time. The seventh is a reference pen which may be operated by push button from the control station to locate events during the progress of a stop which it may be desired to record on the graph.

A portion of the graphic record of a stop from 88 m.p.h., with a total brake-shoe pressure of 100 per cent and a wheel load of 27,500 lb. is reproduced with this article. For convenience of reading one brake-load pen and one torque pen are offset longitudinally. The sensitiveness of the load-measuring equipment is indicated by the character of both the brake-load and torque lines. The waves in the lines coincide in distance with the circumference of the 36-in. rolled-steel wheel on which



The Controls and Recording Equipment Are Brought Together in a Single Cabinet

the test recorded was made, which was slightly out of round. A slight maladjustment of the crosshead guides of the brake shoe showing the more marked variation in load accounts for that condition. The uniformity of the automatically maintained air-cylinder pressure is clearly indicated on the graph. The travel of the paper on the recorder drum is proportioned to the distance traveled by the wheel during the stop. The shaft, driven from the end of the testing-machine spindle, is carried under the floor to the control cabinet to drive the recorder drum.

The flexibility of control of the new machine, with speed and load capacities practically double that of earlier machines, makes possible for the first time the laboratory duplication of the braking of a car of any kind, passenger or freight, during a stop, a slow-down, control on grade, or the entire sequence of braking during the operation of a train between two points. It will permit the study of the effects on brake shoes and wheels of the high rates of energy dissipation called for by the high speeds now rapidly becoming a part of regular operating practice.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended July 11 totaled 724,324 cars, an increase of 74,565 cars as compared with the previous week, which included a holiday, and an increase of 158,822 cars, or 28.1 per cent, as compared with the total for the corresponding week of last year. Loading of all classes of commodities showed increases over last year's figures, miscellaneous freight showing a gain of 54,618 cars, and grain and grain products an increase of 26,969 cars. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, July 11

Districts	1936	1935	1934
Eastern	149,021	121,627	130,441
Allegheny	142,362	103,085	116,745
Pocahontas	47,907	36,031	39,838
Southern	93,542	79,406	79,359
Northwestern	119,223	86,519	90,979
Central Western	113,175	90,751	97,288
Southwestern	59,094	48,083	49,542
Total Western Districts	291,492	225,353	237,809
Total All Roads	724,324	565,502	604,192
Commodities			
Grain and Grain Products	56,250	29,281	43,089
Live Stock	14,402	11,047	20,724
Coal	107,378	75,390	95,653
Coke	9,339	4,477	4,459
Forest Products	31,020	26,715	21,890
Ore	54,979	34,642	32,711
Merchandise L.C.L.	163,116	150,728	157,853
Miscellaneous	287,840	233,222	227,813
July 11	724,324	565,502	604,192
July 4	649,759	471,126	520,741
June 27	713,639	616,863	646,003
June 20	690,716	567,049	623,322
June 13	686,812	652,111	618,881
Cumulative Total, 28 Weeks	17,964,953	16,197,357	16,561,556

Car Loading in Canada

Car loadings in Canada for the week ended July 11 totaled 47,912, as against 45,668 cars in 1935 and 43,172 in the preceding week, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
July 11, 1936	47,912	21,251
July 4, 1936	43,172	22,577
June 27, 1936	46,909	22,601
July 13, 1935	45,668	17,159
Cumulative Totals for Canada:		
July 11, 1936	1,216,910	655,202
July 13, 1935	1,199,488	616,180
July 14, 1934	1,180,150	640,910

THE TOTAL OF 35,434 SHIPMENTS handled by the Air Express Division of Railway Express Agency in May represents a 60 percent increase in air express revenue over the combined express revenue of the Division's contract air lines for May, 1935, according to a report issued by the Agency on July 13. Railway Express Agency's consolidation by contract of almost all of the country's air lines, in an air express system covering North, Central and South America, and the Philippine Islands, became effective February 1.

Air Brake and Signal Companies Elect Officers

A. L. Humphrey asks to be relieved of heavy responsibilities he has been carrying

SEVERAL changes have been made in the officers of the Westinghouse Air Brake Company of Wilmerding, Pa., and the Union Switch & Signal Company of Swissvale, Pa. A. L. Humphrey, who has been chairman of the board of both companies, requested relief from the heavy responsibilities which he has been carrying. It will be recalled that in the spring of 1932 the managerial staffs of both the air brake and the signal companies were co-ordinated, in the interests of greater efficiency and economy and to improve their productive capacity.

At the meetings on Friday, July 17, Charles A. Rowan, who for the past four years has been president of the Westinghouse Air Brake Company and vice-chairman of the board of directors of the Union Switch & Signal Company, was elected chairman of the board of both of these companies, succeeding Mr. Humphrey, who was made chairman of the executive committee for both organizations. George A. Blackmore, who has been vice-president and general manager of the Westinghouse Air Brake Company, was elected to the presidency of that company, succeeding Mr. Rowan. Mr. Blackmore retains the presidency of the Union Switch & Signal Company and is therefore now president of both organizations. It was reported that business has been improving for both of the companies, more than 1,500 employees being added since June 30, 1936, making the total force for both plants now about 6,300.

A. L. Humphrey

Charles A. Rowan

George A. Blackmore

A. L. Humphrey has been associated with the Westinghouse Air Brake Company since 1903, and with the Union Switch & Signal Company since 1916. He was born in Buffalo, N. Y., June 12, 1860, and entered business at the age of fourteen. When 22 years of age he organized a general machine shop and foundry in Seattle, which afterwards became the Moran Iron Works. Later he entered railroad service as division construction foreman on the Mojave division of the Central Pacific, afterwards becoming master mechanic. He then went with the Colorado Midland as superintendent of motive power. While in Colorado he took an active part in politics and was twice elected to the state House of Representatives, serving as speaker during his second term.

Mr. Humphrey returned to railroad service on the Colorado & Southern in 1899, and in 1903 became superintendent of motive power of the Chicago & Alton. He remained in that position only a short time, however, being appointed western manager of the Westinghouse Air Brake Company at Chicago in the latter part of 1903. In 1905 he went to Wilmerding, Pa., as general manager of the company. He was elected a director of the company in 1909 and was also made vice-president and general manager. When the Union Switch & Signal Company was taken over by the Air Brake Company in 1916 he was also elected president of the Signal Company. In April, 1919, he was elected president of the Air Brake Company and later also became chairman of the board of the Signal Company, which position he held until his election as executive director of both companies in 1932. Mr. Humphrey has always been extremely active in fighting for the best interests of the railroads and the railroad supply industry.

Charles A. Rowan, who now becomes chairman of the board of both the air brake and the signal companies, has been associated with Westinghouse interests throughout his entire business career. He started with the East

Pittsburgh Improvement Company, which owned the land now occupied by the various Westinghouse industrial establishments in the Turtle Creek Valley. His first association with the Air Brake Company was in 1903, as assistant auditor. He became auditor in 1910, controller in 1916, vice-president and controller in 1919, and president of the Westinghouse International Brake & Signal Company in 1927, being transferred to Brussels, Belgium. He returned to this country in 1930 to become executive vice-president of the Westinghouse Air Brake Company. He was elected a member of the board of directors of the Westinghouse Air Brake Company in 1929 and became president of that company, and vice-chairman of the board of the Union Switch & Signal Company in 1932.

George A. Blackmore, who now becomes president of the Westinghouse Air Brake Company as well as the Union Switch & Signal Company, was born at Wilkinsburg, Pa., in 1884, and began his business career with the Union Switch & Signal Company as an office boy in July, 1896. He was made chief clerk of the engineering department in 1900, and from 1904 until 1916 was associated with the New York office of the company, holding the positions, successively, of chief clerk, assistant business manager, and eastern manager in charge of the New York, Montreal and Atlanta offices. He became general sales manager of the company, with headquarters at Swissvale, in 1916, and in 1917 was elected second vice-president. In 1922 he was elected first vice-president and general manager, and in 1929, president. He was elected vice-president and general manager of the Westinghouse Air Brake Company in 1932 and was also elected a director at that time.

Wood Preservation Gains 16 Per Cent in 1935

THERE was a sharp increase in the quantity of timber given preservative treatment in the United States in 1935, the third successive year in which increases have been shown, according to figures compiled by R. K. Helphenstine, Jr., Forest Service, United States Department of Agriculture, in co-operation with the American Wood-Preservers' Association. As in previous years, the railway industry maintained its status in 1935 as the principal consumer of treated timber. Ever since the compilation of these statistics was started in 1909, crossties have comprised the bulk of the wood given preservative treatment. Thus in 1933, ties constituted 54 per cent of the total; in 1934 51 per cent, and in 1935 to 58 per cent. Crossties and switch ties combined accounted for slightly more than 62 per cent of the total, as compared with 55 per cent in 1934.

The total quantity of timber given preservative treatment in 1935 was 179,438,970 cu. ft., an increase of 24,333,247 cu. ft. or approximately 16 per cent, as compared with the quantity treated in 1934. As compared with the peak year of 1929, however, it comprises a decrease of 50 per cent. Increases, compared with 1934, were registered in six of the eight classes of material given treatment, the exceptions being piles and crossarms, the largest increase, amounting to 18,230,680 cu. ft. being in crossties. Poles ranked second with an increase of almost 4,000,000 cu. ft., and switch ties third with an increase of 1,057,994 cu. ft. Miscellaneous material, wood blocks and construction timbers came next in the order named. The total volume of wood treated in 1935 was greater than for any year prior to 1923, except 1921, in which year the quantity treated was slightly above that for 1935.

The number of crossties given preservative treatment last year totaled 34,503,147, representing 103,509,441 cu. ft., as compared with 28,459,587 treated in 1934. This represents a gain of 6,043,560 crossties, or more than 21 per cent. Of this total, 14,874,561 were hewed and 19,628,586 were sawed. During the year, 94,037,859 ft. b.m. of switch ties, equivalent to 7,836,488 cu. ft., received preservative treatment. This compares with 81,341,922 ft. b.m. of this class of material in 1934, a gain of 12,695,937 ft. b.m., or 15.6 per cent.

Of the total ties treated during the year, 20,054,681, or 58.13 per cent, were treated with creosote; 12,253,422, or 35.51 per cent were treated with creosote-petroleum mixtures; while only 2,084,974, or 6.04 per cent received treatment with zinc chloride; and 110,070, or 0.32 per cent with miscellaneous preservatives. During 1935 all ties receiving treatment were treated by the pressure process. Of the total number of ties treated, 21,078,821 were bored and adzed prior to treatment; 194,382 were adzed but not bored; 2,421,322 were bored but not adzed; and 10,808,622, or almost one-third of the total were neither preadzed nor prebored.

Classes of Material Treated in 1935

Class of material	Cubic feet	Per cent of Total
Crossties	103,509,441	57.7
Switch ties	7,836,488	4.4
Piles	8,574,542	4.8
Poles	35,793,120	19.3
Wood blocks	1,483,810	0.8
Construction timbers	15,683,306	9.3
Crossarms	351,476	0.2
Miscellaneous	6,206,787	3.5
Total	179,438,970	100.0

For many years, oak ties ranked first in the number treated, with southern pine occupying second place. This relative position was reversed first in 1934, when southern pine advanced to first place, with oak second and Douglas fir third. In 1935 there was again a change in the relative rank of these woods. During this year oak regained the position it had held for so long, the oak ties treated numbering 15,264,732, or 44 per cent of the total. Southern pine returned to second place, with 6,583,939 ties, or 19 per cent; Douglas fir remained in third place, with 4,121,341 ties, or 12 per cent; and ponderosa pine ranked fourth, with 1,621,123 ties, or 4.7 per cent, while gum was almost equal, with 1,539,349 ties, or 4.5 per cent. Among the other woods represented were maple, beech, birch, tamarack, lodgepole pine, elm and hemlock, in the order named. All other woods taken collectively amounted to 230,267 ties, or only 0.67 per cent of the total number treated.

Treatment of Miscellaneous Material (Ft. b.m.)

	1935	1934	1933	1932
Lumber	49,705,675	42,879,728	22,200,171	33,994,619
Fence posts	9,564,829	8,462,601	7,385,168	2,995,174
Tie plugs	1,332,533	2,092,863	1,406,979	652,489
Crossing plank	290,059	135,006	1,272	392,830
Car lumber	227,826	506,552	3,939	.....

In the case of switch ties, oak also ranked first with respect to the volume treated, with a total of 55,547,937 ft. b.m., or more than 59 per cent of the total. Douglas fir ranked second with 16,891,784 ft. b.m., or 18 per cent. Southern pine was third with 11,639,089 ft. b.m., or 12 per cent; and gum occupied fourth place, with 5,832,563 ft. b.m., or more than 6 per cent. These four woods accounted for more than 95 per cent of all switch ties treated.

There was a slight decrease, amounting to 94,828 lin.

ft., in the volume of piles treated, as compared with 1934, the total for 1935 being 12,678,607 lin. ft., but this was far ahead of 1933. More than 82 per cent of all of the piles treated during the year were southern pine, the total for this wood being 10,490,989 lin. ft. Douglas fir was next in importance, with 1,817,312 lin. ft., or 14 per cent. The remainder, approximately 370,000 lin. ft., consisted of oak and miscellaneous species. It is of interest to note that only 22,754 lin. ft. of piles were treated with preservatives other than creosote.

Creosote consumed by the wood-preserving industry in 1935 amounted to 124,747,743 gal., this being 5,698,139 gal. more than was used in 1934. This is the largest consumption since 1931 and is larger than for any year prior to 1923. In other words, the 1935 consumption has been exceeded in only 9 of the 27 years since this record was started. Of the total creosote consumed, only 18,010,777 gal. was imported, the remainder, 106,736,966 gal., having been of domestic origin. The consumption of zinc chloride increased by 858,166 lb. over the 1934 consumption, to 4,080,887 lb. This is the first break in the steady decline in the consumption of zinc chloride since 1924, in which year 33,208,675 lb. were consumed. It is also the second smallest consumption of this salt since the record was started in 1909.

Wood Preservation, 1909-1935

Together with consumption of creosote and zinc chloride

Year	Total Material Treated Cu. Ft.	Number of Crossties Treated	Creosote Used, Gal.	Zinc Chloride Used, Lb.
1909	75,946,419	20,693,012	51,426,212	16,215,107
1910	100,074,144	26,155,677	63,266,271	16,802,532
1911	111,524,563	28,394,140	73,027,335	16,359,797
1912	125,931,056	32,394,336	83,666,490	20,751,711
1913	153,613,888	40,260,416	108,378,359	26,466,803
1914	159,582,639	43,846,987	79,334,606	27,212,259
1915	140,858,963	37,085,585	80,859,442	33,269,604
1916	150,522,982	37,469,368	90,404,749	26,746,577
1917	137,338,586	33,459,470	75,541,737	26,444,689
1918	122,612,890	30,609,209	52,776,386	31,101,111
1919	146,060,994	37,567,247	65,556,247	43,483,134
1920	173,309,505	44,987,532	68,757,508	49,717,929
1921	201,643,228	55,383,515	76,513,279	51,375,360
1922	166,620,347	41,316,474	86,321,389	29,868,639
1923	224,375,468	53,610,175	127,417,305	28,830,817
1924	268,583,235	62,632,710	157,305,358	33,208,675
1925	274,474,538	62,563,911	167,642,790	26,378,658
1926	289,322,079	62,654,538	185,733,180	24,777,020
1927	345,685,804	74,231,840	219,778,430	22,162,718
1928	335,920,379	70,114,405	220,478,409	23,524,340
1929	362,009,047	71,023,103	226,374,227	19,848,813
1930	332,318,577	63,267,107	213,904,421	13,921,894
1931	233,334,302	48,611,164	155,437,247	10,323,443
1932	157,418,589	35,045,483	105,671,264	7,669,126
1933	125,955,828	22,696,565	85,180,709	4,991,792
1934	155,105,723	28,459,587	119,049,604	3,222,721
1935	179,438,970	34,503,147	124,747,743	4,080,887

The wood-preserving industry also consumed 19,205,319 gal. of petroleum in 1935. This represents an increase of 4,224,020 gal. over that of 1934, and compares with the 29,656,181 gal. used in 1929, the year of largest consumption. The consumption of miscellaneous salts increased from 805,150 lb. in 1934 to 966,825 lb. in 1935; while miscellaneous liquid preservatives declined from 5,480 gal. to 2,741 gal.

At the close of 1935 there were 214 wood-preserving plants in the United States, 5 more than in 1934. Of this number, 195 were in active operation, an increase of 8 as compared with 1934, and 19 were idle. Three new plants of the pressure type and one of the non-pressure type were built in 1935, and 2 non-pressure plants were abandoned. Of the plants in active operation, 133 were of the pressure-cylinder type, 47 were of the non-pressure (open-tank) type and 15 were equipped for both pressure and non-pressure treatment. Of the 214 plants in existence at the close of 1935, 162 were commercial plants which treat wood for sale or by contract, 25 were owned and operated by railways and 27 belonged to public utility corporations, mining companies or the federal government.

Suggests Electrification on 20 Railroads

WASHINGTON, D. C.

ELECTRIFICATION of 12,000 miles of track (5,429 route-miles) on twenty railroads is suggested in a report compiled by the Federal Power Commission's National Power Survey, entitled "The Use of Electric Power In Transportation," made public on July 19. It is estimated that this would cost $600,000,000 and produce a potential annual energy consumption of five billion kilowatt-hours.

The report is part of a comprehensive study of the electric power requirements of the nation. The source of funds for electrification, methods of financing, and the financial condition of the railroads involved are not discussed in the report but it is stated that these should be considered by the owners and managements of the railroads included in the study and by the governmental agencies having jurisdiction over such problems.

"It should not be inferred," the report says, "that this mileage is all that may be electrified or that the studies herein have been in sufficient detail to warrant definite conclusions that the 'suggested' electrifications are economically justified. On the other hand, many of the sections included have previously been proposed for electrification and studies made by the railroads or consulting engineers, so that the estimate of electrification to the extent of increasing the potential annual energy consumption of the country by five billion kilowatt-hours appears reasonable."

Pointing out that there are approximately 250,000 route miles of railroad in the United States, the report says that a large part of this mileage is to-day economically unsuited for electrification, because such conditions of traffic and operation must exist as either to permit the savings resulting from electrification to provide a reasonable return on the additional investment, or to obtain needed service improvements unobtainable except by electrification. Therefore, instead of an approach to the problem on the basis of the possibilities of more or less complete electrification, it was considered to be more practical to select for study certain sections of trunk line railroads on which the presence of heavy grades, or the volume and character of the traffic, or the availability of cheap power supply might indicate that electrification would be economically feasible.

Twenty railroads were selected from the general study as showing the best possibilities for electrification, some roads having two or more divisions suitable for electric operation. The list follows:

Steam Railroad Electrifications Considered Feasible

Railroad	Location of Electrification	Miles of Route	Estimated Annual Energy Consumption (Kwh)
Boston & Maine	Boston to Troy and Rotterdam Junction, N. Y.	225	154,800,000
New York, New Haven & Hartford	New Haven to Boston, (Shore Line)	157	128,600,000
New York Central	Croton to Buffalo, N. Y.:		
	Hudson division	108	142,400,000
	Mohawk division	148	265,800,000
	Syracuse division	146	276,800,000
Erie	Jersey City, to Susquehanna, N. Y.	198	180,600,000
	Salamanca, N. Y., to Cleveland, Ohio	216	134,500,000
Delaware, Lackawanna & Western	Secaucus, N. J, to Clarks Summit, Pa.	137	200,000,000
Reading	Tamaqua and St. Clair to Philadelphia (Port Richmond), Pa.	118	122,000,000
	Shippensburg to Allentown, Pa.	132	144,000,000
Pennsylvania	Pittsburgh (Conway yard) to Altoona, Pa.	137	432,300,000

	Altoona to Marysville (Harrisburg), Pa.	124	299,400,000
	Marysville to Paoli (Philadelphia), Pa.	90	121,600,000
	Marysville to Morrisville, Pa. (freight line)	140	214,300,000
Baltimore & Ohio	Baltimore (Bay View), Md., to Glenwood Junction, Pa.	320	349,600,000
	Cumberland, Md., to Fairmont, W. Va.	123	144,100,000
Chesapeake & Ohio	Clifton Forge, Va., to Russell, Ky.	250	228,400,000
Virginian	Mullens to West Deepwater, W. Va.	58	17,000,000
Norfolk & Western	Bluefield to Iaeger, W. Va.	53	48,500,000
	Roanoke (Blue Ridge), Va. to Bluefield, W. Va.	113	110,200,000
	Iaeger to Williamson, W. Va.	47	93,000,000
Louisville & Nashville	Cincinnati, Ohio, to Corbin, Ky.	187	58,900,000
	Corbin, Ky., to Harlan, Ky.	70	24,300,000
Chicago, Milwaukee, St. Paul & Pacific	Avery, Idaho to Othello, Wash.	212	20,000,000
Great Northern	Skykomish to Seattle, Wash.	85	20,000,000
Union Pacific	Cheyenne, Wyo., to Ogden, Utah	483	374,000,000
Oregon Short Line	Granger, Wyo., to Pocatello, Idaho	215	58,700,000
Denver & Salt Lake	Denver to Bond, Colo.	129	36,800,000
Denver & Rio Grande Western	Helper to Ogden, Utah	156	49,900,000
Atchison, Topeka & Santa Fe	San Bernardino, Cal. to Winslow, Ariz.	542	284,200,000
Southern Pacific	Roseville, Calif., to Sparks, Nev.	139	131,400,000
	Bakersfield to Los Angeles, Cal.	171	107,000,000
			4,973,100,000

"On the return of more prosperous times," the report says, "with the resulting increased freight movement and with the increase in the traveling habit of a growing population, the transportation needs of the country are certain to increase. Undoubtedly, increases greater than the average will be shown over sections of lines and systems strategically located with their traffic further augmented by consolidations, rearrangement of terminals and improvements in facilities. The traffic density on these sections will be relatively high and the electrification of many of them should be economically feasible on the basis of the saving in operating expenses. On some other divisions, in spite of the low traffic density, electrification may be justified by the presence of mountain grades, tunnels, and the many other economic considerations discussed in this report."

The report shows that up to 1935 there had been a total of 2,768 route-miles, or 6,441 track-miles, electrified on 29 steam railroads in the United States and that these 29 railroads used for traction purposes nearly 1½ billion kilowatt-hours of electric energy in 1934. While the mileage electrified represents only 1.1 per cent of the country's total railroad mileage, 10 per cent of the country's passenger-car miles were handled over it electrically during the 10 months ending with October, 1935. In contrast with railroad electrification in the United States, the rest of the world has electrified approximately 10,000 route-miles, with countries of Europe in the lead.

Presented in tabular form are the 29 present steam railroad electrifications, their locations, number of route and track-miles of each, class of traffic electrified, reasons for electrification, and other important characteristics. In addition, a section of the report discusses briefly the history and development of each of the present electrifications, and contains maps showing their location and relation, both to the railroad as a whole and to suggested electrifications.

The considerations leading to the selection of the proposed electrifications are traffic density, ruling grades, and the possibility of efficient operation of motive power in connection with adjacent steam operations. All of the proposed electrifications are on principal main lines where the greatest density of freight or passenger traffic occurs. The tonnages of the past four years are not considered as representative of future traffic conditions and therefore, in most cases, the freight traffic of the period from 1926 to 1929 has been used as being more representative of the traffic that may be expected in the near future on most of the sections under consideration.

The annual traffic densities vary from 88.5 million gross ton-miles on the Pennsylvania to 2.9 million gross ton-miles on the Chicago, Milwaukee, St. Paul & Pacific, where the connection of two existing electrifications with consequent increase in operating efficiency was the determining factor. Ruling grades as high as 2.2 per cent were found on some of the sections, while on others the grade was negligible. The sections considered for electrification vary in length from 542 miles to 47 miles, depending upon the co-ordination of operation with that on adjacent sections.

Eastern roads and coal carriers predominate, as might be expected, in track mileage which appears feasible for electrification, because their traffic density is greater than that of the Western roads. The Union Pacific and the Southern Pacific qualify on traffic density; but it is stated that electrifications of the other western roads discussed in this report appear to be justified by reason of their co-ordinated operations with existing sections, and the steep grades and tunnels encountered in the territory.

In a chapter devoted to the economics of railroad electrification, the report points out that the most important measure of the feasibility of electrification is the density of traffic. If the total freight moving over a section of double-track railroad amounts to more than 12,000,000 gross ton-miles annually, the additional expenditures required to electrify appear to be justified, the report says, particularly if proper weight is given to collateral advantages which are not always reflected as direct savings. If traffic does not reach such proportions, the report continues, the presence of high fuel costs, of frequent and difficult grades, or of the requirement for speeds greater than those that are feasible with steam operation frequently indicate the economic desirability of electrification.

Commencing with the more definite and generally more important items, the following are the factors most favorably affecting the economic feasibility of electrification:

1. Reduction in locomotive maintenance and engine house expense.

2. Although in general the substitution of electric energy will produce no major saving in fuel cost, electrification will release locomotives and cars used for hauling fuel for revenue producing business.

3. Water storage tanks and water-handling are eliminated.

4. Helper or pusher operation with its high stand-by and extra crew expenses are eliminated.

5. The greater availability of the electric over the steam locomotive, which permits the electric locomotive to make 1½ to 2 times the mileage per year of the steam locomotive. The electric locomotive does not require the attention necessary to the steam type and therefore for the same traffic fewer electric locomotives are needed.

6. Railroad electrification has consistently resulted in increased track capacity and has frequently precluded the necessity of installing additional tracks. This is most important in congested city terminals where land values often prohibit the expansion of facilities and in such cases this saving alone may justify the cost of electrification.

7. The elimination of delays, hazards of operation and installation of ventilating equipment in tunnels and underground terminals.

The total energy used by electrified railroads, exclusive of street railways, in 1933 amounted to 607,070,000 kilowatt-hours generated and 715,742,000 kilowatt-hours purchased, a total of 1,322,812,000 kilowatt-hours. Prices

ft., in the volume of piles treated, as compared with 1934, the total for 1935 being 12,678,607 lin. ft., but this was far ahead of 1933. More than 82 per cent of all of the piles treated during the year were southern pine, the total for this wood being 10,490,989 lin. ft. Douglas fir was next in importance, with 1,817,312 lin. ft., or 14 per cent. The remainder, approximately 370,000 lin. ft., consisted of oak and miscellaneous species. It is of interest to note that only 22,754 lin. ft. of piles were treated with preservatives other than creosote.

Creosote consumed by the wood-preserving industry in 1935 amounted to 124,747,743 gal., this being 5,698,139 gal. more than was used in 1934. This is the largest consumption since 1931 and is larger than for any year prior to 1923. In other words, the 1935 consumption has been exceeded in only 9 of the 27 years since this record was started. Of the total creosote consumed, only 18,010,777 gal. was imported, the remainder, 106,736,966 gal., having been of domestic origin. The consumption of zinc chloride increased by 858,166 lb. over the 1934 consumption, to 4,080,887 lb. This is the first break in the steady decline in the consumption of zinc chloride since 1924, in which year 33,208,675 lb. were consumed. It is also the second smallest consumption of this salt since the record was started in 1909.

Wood Preservation, 1909-1935

Together with consumption of creosote and zinc chloride

Year	Total Material Treated Cu. Ft.	Number of Crossties Treated	Creosote Used, Gal.	Zinc Chloride Used, Lb.
1909	75,946,419	20,693,012	51,426,212	16,215,107
1910	100,074,144	26,155,677	63,266,271	16,802,532
1911	111,524,563	28,394,140	73,027,335	16,359,797
1912	125,931,056	32,394,336	83,666,490	20,751,711
1913	153,613,888	40,260,416	108,378,359	26,466,803
1914	159,582,639	43,846,987	79,334,606	27,212,259
1915	140,858,963	37,085,585	80,859,442	33,269,604
1916	150,522,982	37,469,368	90,404,749	26,746,577
1917	137,338,586	33,459,470	75,541,737	26,444,689
1918	122,612,890	30,609,209	52,776,386	31,101,111
1919	146,060,994	37,567,247	65,556,247	43,483,134
1920	173,309,505	44,987,532	68,757,508	49,717,929
1921	201,643,228	55,383,515	76,513,279	51,375,360
1922	166,620,347	41,316,474	86,321,389	29,868,639
1923	224,375,468	53,610,175	127,417,305	28,830,817
1924	268,583,235	62,632,710	157,305,358	33,208,675
1925	274,474,538	62,563,911	167,642,790	26,378,658
1926	289,322,079	62,654,538	185,733,180	24,777,020
1927	345,685,804	74,231,840	219,778,430	22,162,718
1928	335,920,379	70,114,405	220,478,409	23,524,340
1929	362,009,047	71,023,103	226,374,227	19,848,813
1930	332,318,577	63,267,107	213,904,421	13,921,894
1931	233,334,302	48,611,164	155,437,247	10,323,443
1932	157,418,589	35,045,483	105,671,264	7,669,126
1933	125,955,828	22,696,565	85,180,709	4,991,792
1934	155,105,723	28,459,587	119,049,604	3,222,721
1935	179,438,970	34,503,147	124,747,743	4,080,887

The wood-preserving industry also consumed 19,205,319 gal. of petroleum in 1935. This represents an increase of 4,224,020 gal. over that of 1934, and compares with the 29,656,181 gal. used in 1929, the year of largest consumption. The consumption of miscellaneous salts increased from 805,150 lb. in 1934 to 966,825 lb. in 1935; while miscellaneous liquid preservatives declined from 5,480 gal. to 2,741 gal.

At the close of 1935 there were 214 wood-preserving plants in the United States, 5 more than in 1934. Of this number, 195 were in active operation, an increase of 8 as compared with 1934, and 19 were idle. Three new plants of the pressure type and one of the non-pressure type were built in 1935, and 2 non-pressure plants were abandoned. Of the plants in active operation, 133 were of the pressure-cylinder type, 47 were of the non-pressure (open-tank) type and 15 were equipped for both pressure and non-pressure treatment. Of the 214 plants in existence at the close of 1935, 162 were commercial plants which treat wood for sale or by contract, 25 were owned and operated by railways and 27 belonged to public utility corporations, mining companies or the federal government.

Suggests Electrification on 20 Railroads

WASHINGTON, D. C.

ELECTRIFICATION of 12,000 miles of track (5,429 route-miles) on twenty railroads is suggested in a report compiled by the Federal Power Commission's National Power Survey, entitled "The Use of Electric Power In Transportation," made public on July 19. It is estimated that this would cost $600,000,000 and produce a potential annual energy consumption of five billion kilowatt-hours.

The report is part of a comprehensive study of the electric power requirements of the nation. The source of funds for electrification, methods of financing, and the financial condition of the railroads involved are not discussed in the report but it is stated that these should be considered by the owners and managements of the railroads included in the study and by the governmental agencies having jurisdiction over such problems.

"It should not be inferred," the report says, "that this mileage is all that may be electrified or that the studies herein have been in sufficient detail to warrant definite conclusions that the 'suggested' electrifications are economically justified. On the other hand, many of the sections included have previously been proposed for electrification and studies made by the railroads or consulting engineers, so that the estimate of electrification to the extent of increasing the potential annual energy consumption of the country by five billion kilowatt-hours appears reasonable."

Pointing out that there are approximately 250,000 route miles of railroad in the United States, the report says that a large part of this mileage is to-day economically unsuited for electrification, because such conditions of traffic and operation must exist as either to permit the savings resulting from electrification to provide a reasonable return on the additional investment, or to obtain needed service improvements unobtainable except by electrification. Therefore, instead of an approach to the problem on the basis of the possibilities of more or less complete electrification, it was considered to be more practical to select for study certain sections of trunk line railroads on which the presence of heavy grades, or the volume and character of the traffic, or the availability of cheap power supply might indicate that electrification would be economically feasible.

Twenty railroads were selected from the general study as showing the best possibilities for electrification, some roads having two or more divisions suitable for electric operation. The list follows:

Steam Railroad Electrifications Considered Feasible

Railroad	Location of Electrification	Miles of Route	Estimated Annual Energy Consumption (Kwh)
Boston & Maine	Boston to Troy and Rotterdam Junction, N. Y.	225	154,800,000
New York, New Haven & Hartford	New Haven to Boston, (Shore Line)	157	128,600,000
New York Central	Croton to Buffalo, N. Y.:		
	Hudson division	108	142,400,000
	Mohawk division	148	265,800,000
	Syracuse division	146	276,800,000
Erie	Jersey City, to Susquehanna, N. Y.	198	180,600,000
	Salamanca, N. Y., to Cleveland, Ohio	216	134,500,000
Delaware, Lackawanna & Western	Secaucus, N. J, to Clarks Summit, Pa.	137	200,000,000
Reading	Tamaqua and St. Clair to Philadelphia (Port Richmond), Pa.	118	122,000,000
	Shippensburg to Allentown, Pa.	132	144,000,000
Pennsylvania	Pittsburgh (Conway yard) to Altoona, Pa.	137	432,300,000

	Altoona to Marysville (Harrisburg), Pa.	124	299,400,000
	Marysville to Paoli (Philadelphia), Pa.	90	121,600,000
	Marysville to Morrisville, Pa. (freight line)	140	214,300,000
Baltimore & Ohio	Baltimore (Bay View), Md., to Glenwood Junction, Pa.	320	349,600,000
	Cumberland, Md., to Fairmont, W. Va.	123	144,100,000
Chesapeake & Ohio	Clifton Forge, Va., to Russell, Ky.	250	228,400,000
Virginian	Mullens to West Deepwater, W. Va.	58	17,000,000
Norfolk & Western	Bluefield to Iaeger, W. Va.	53	48,500,000
	Roanoke (Blue Ridge), Va. to Bluefield, W. Va.	113	110,200,000
	Iaeger to Williamson, W. Va.	47	93,000,000
Louisville & Nashville	Cincinnati, Ohio, to Corbin, Ky.	187	58,900,000
	Corbin, Ky., to Harlan, Ky.	70	24,300,000
Chicago, Milwaukee, St. Paul & Pacific	Avery, Idaho to Othello, Wash.	212	20,000,000
Great Northern	Skykomish to Seattle, Wash.	85	20,000,000
Union Pacific	Cheyenne, Wyo., to Ogden, Utah	483	374,000,000
Oregon Short Line	Granger, Wyo., to Pocatello, Idaho	215	58,700,000
Denver & Salt Lake	Denver to Bond, Colo.	129	36,800,000
Denver & Rio Grande Western	Helper to Ogden, Utah	156	49,900,000
Atchison, Topeka & Santa Fe	San Bernardino, Cal. to Winslow, Ariz.	542	284,200,000
Southern Pacific	Roseville, Calif., to Sparks, Nev.	139	131,400,000
	Bakersfield to Los Angeles, Cal.	171	107,000,000
			4,973,100,000

"On the return of more prosperous times," the report says, "with the resulting increased freight movement and with the increase in the traveling habit of a growing population, the transportation needs of the country are certain to increase. Undoubtedly, increases greater than the average will be shown over sections of lines and systems strategically located with their traffic further augmented by consolidations, rearrangement of terminals and improvements in facilities. The traffic density on these sections will be relatively high and the electrification of many of them should be economically feasible on the basis of the saving in operating expenses. On some other divisions, in spite of the low traffic density, electrification may be justified by the presence of mountain grades, tunnels, and the many other economic considerations discussed in this report."

The report shows that up to 1935 there had been a total of 2,768 route-miles, or 6,441 track-miles, electrified on 29 steam railroads in the United States and that these 29 railroads used for traction purposes nearly 1½ billion kilowatt-hours of electric energy in 1934. While the mileage electrified represents only 1.1 per cent of the country's total railroad mileage, 10 per cent of the country's passenger-car miles were handled over it electrically during the 10 months ending with October, 1935. In contrast with railroad electrification in the United States, the rest of the world has electrified approximately 10,000 route-miles, with countries of Europe in the lead.

Presented in tabular form are the 29 present steam railroad electrifications, their locations, number of route and track-miles of each, class of traffic electrified, reasons for electrification, and other important characteristics. In addition, a section of the report discusses briefly the history and development of each of the present electrifications, and contains maps showing their location and relation, both to the railroad as a whole and to suggested electrifications.

The considerations leading to the selection of the proposed electrifications are traffic density, ruling grades, and the possibility of efficient operation of motive power in connection with adjacent steam operations. All of the proposed electrifications are on principal main lines where the greatest density of freight or passenger traffic occurs. The tonnages of the past four years are not considered as representative of future traffic conditions and therefore, in most cases, the freight traffic of the period from 1926 to 1929 has been used as being more representative of the traffic that may be expected in the near future on most of the sections under consideration.

The annual traffic densities vary from 88.5 million gross ton-miles on the Pennsylvania to 2.9 million gross ton-miles on the Chicago, Milwaukee, St. Paul & Pacific, where the connection of two existing electrifications with consequent increase in operating efficiency was the determining factor. Ruling grades as high as 2.2 per cent were found on some of the sections, while on others the grade was negligible. The sections considered for electrification vary in length from 542 miles to 47 miles, depending upon the co-ordination of operation with that on adjacent sections.

Eastern roads and coal carriers predominate, as might be expected, in track mileage which appears feasible for electrification, because their traffic density is greater than that of the Western roads. The Union Pacific and the Southern Pacific qualify on traffic density; but it is stated that electrifications of the other western roads discussed in this report appear to be justified by reason of their co-ordinated operations with existing sections, and the steep grades and tunnels encountered in the territory.

In a chapter devoted to the economics of railroad electrification, the report points out that the most important measure of the feasibility of electrification is the density of traffic. If the total freight moving over a section of double-track railroad amounts to more than 12,000,000 gross ton-miles annually, the additional expenditures required to electrify appear to be justified, the report says, particularly if proper weight is given to collateral advantages which are not always reflected as direct savings. If traffic does not reach such proportions, the report continues, the presence of high fuel costs, of frequent and difficult grades, or of the requirement for speeds greater than those that are feasible with steam operation frequently indicate the economic desirability of electrification.

Commencing with the more definite and generally more important items, the following are the factors most favorably affecting the economic feasibility of electrification:

1. Reduction in locomotive maintenance and engine house expense.

2. Although in general the substitution of electric energy will produce no major saving in fuel cost, electrification will release locomotives and cars used for hauling fuel for revenue producing business.

3. Water storage tanks and water-handling are eliminated.

4. Helper or pusher operation with its high stand-by and extra crew expenses are eliminated.

5. The greater availability of the electric over the steam locomotive, which permits the electric locomotive to make 1½ to 2 times the mileage per year of the steam locomotive. The electric locomotive does not require the attention necessary to the steam type and therefore for the same traffic fewer electric locomotives are needed.

6. Railroad electrification has consistently resulted in increased track capacity and has frequently precluded the necessity of installing additional tracks. This is most important in congested city terminals where land values often prohibit the expansion of facilities and in such cases this saving alone may justify the cost of electrification.

7. The elimination of delays, hazards of operation and installation of ventilating equipment in tunnels and underground terminals.

The total energy used by electrified railroads, exclusive of street railways, in 1933 amounted to 607,070,000 kilowatt-hours generated and 715,742,000 kilowatt-hours purchased, a total of 1,322,812,000 kilowatt-hours. Prices

for electric energy purchased by railroads during the period studied ranged from 5 to 15 mills per kilowatt-hour, with most of the cases studied showing a price between 7 and 9 mills per kilowatt-hour, exclusive of any cost to the railroad for investment in substations or transmission lines.

The report also shows the extent of railroad electrification in foreign countries with a discussion of each country, discusses the use of Diesel motive power for railroad operation, and contains a chapter devoted to a discussion of the history and development of street and interurban railway systems.

Huge Parades Climax Railroad Week

PARADES and picnics on July 18 closed the festivities of Railroad Week in the west. At Chicago, more than 15,000 employees, together with floats and drum and bugle corps, paraded the downtown section, the procession requiring three hours in passing. Carnival spirit was furnished by Indian chiefs and maidens, bathing girls, sunflower girls, Spanish senoritas, clowns, engineers and firemen, together with the floats of various railroads.

The Chicago & North Western's old wood-burning

The Parade Passing Down Michigan Avenue

locomotive, the Pioneer, was in contrast to more modern equipment such as the Santa Fe's Chief, the Milwaukee's Hiawatha draped with bathing girls who threw bonbons to the crowd, the North Western-Union Pacific streamliner, a Chicago & Eastern Illinois locomotive and tender and the Alton's Abraham Lincoln. The procession was headed by the 128th Field Artillery Lancers mounted on horses, while at intervals in the procession were a "Spirit of Railroad" float carrying the Queen of Queens and her court, Indians, the Milwaukee's clown squad car, the Illinois Central Green Diamond girls, the Soo Line float, Santa Fe Indians on horseback, horsemen representing the California Limited, the Navajo, the Ranger and the Scout, Spanish senoritas in headdresses and shawls, the Rock Island's sunflower girls, the Pullman Company float with girls in negligee reclining in open berths, Zeph the donkey mascot of the Burlington's Zephyr, and 25 musical units.

On July 17 a Chicago & North Western track gang of four men won the hand car derby sponsored by the Junior Traffic Club when they traversed the street car tracks on Franklin Street from Madison to North Bank

At the Start of the Hand Car Derby

Drive, one-half mile, in 1 minute 50 seconds, thereby setting a new world s record and bettering the time of the Burlington's gang last year by several seconds. Second place was won by the Milwaukee gang, 1 minute 55 seconds, and third place by the Soo Line crew, 2 minutes and 5 seconds. Later in the day Robert Hood, an Illinois Central red-cap, won a foot race in which the contestants carried four suitcases weighing a total of 60 lb.

At a luncheon at the Traffic Club of Chicago on the same day L. W. Wallace, director of equipment research of the Association of American Railroads, spoke on the air-conditioning of railroad equipment, depicting it as the most important development of the railroads during the last 20 years. In 1932 he said, there were 50 air-conditioned cars; in 1933, 648; in 1934, 1,878; in 1935, 3,350; and in the first four months of this year 860 additional, making a total as of May 1, of 6,738, including those on American and Canadian lines. In an effort to determine the steps necessary for further improvements in air-conditioning of railroad cars, the views and reactions of the traveling public are now being sought, he said.

One of the most interesting activities of Railroad Week was the Western Union Telegraph Company's penmanship contest. More than a thousand entries were received from practically every state in the west and from every major railroad. Frank H. Daman, night chief train dispatcher of the Rock Island at Moline, Ill., was judged the best penman and won the first prize of $50; Earl C. Montgomery, a Santa Fe telegrapher at Albuquerque, N. M., second prize of $25; P. N. Hunter, manager and wire chief of the Missouri Pacific at Poplar Bluff, Mo., third prize of $15; Thomas M. Stib, a telegrapher of the Milwaukee at Plymouth, Wis., fourth prize of $10; and J. H. Kittner, train dispatcher of the North Western at Escanaba, Mich., fifth prize of $5. The winning train order read: "No. 4 Eng. 4006 meet No. 5 Eng. 4059 at Mercer and wait at Lineville until three twenty seven 3:27 a.m. for No. 93 Eng. 2593 and at Allerton until three forty seven 3:47 a.m. for No. 905 Eng. 2693."

A few of the Entrants in the Redcap Race

Railroad Construction Indices for 1935

WASHINGTON, D. C.

THE Bureau of Valuation of the Interstate Commerce Commission, has issued its revised compilation of railroad construction indices covering the year 1935. Taking 1910-1914 cost as 100, the index for the year 1935 for the railroads as a whole is 142. The peak was reached in 1920 when the index reached 226. The valley was penetrated in 1932-1933 when the index sank to 135. Construction items, in which manual labor has been largely supplanted by mechanical, have shown receding costs in recent years, though there has been a slight increase in these accounts largely attributable to higher wages, from the valley of 1933. Notable among these accounts is grading which, from a high of 250 in 1920, fell in 1933 to 98; in 1935 it had advanced to 101.

Accounts in which labor is a large factor reflect increased wages. Notable among these is equipment, which struck a high of 265 in 1920, a low of 153 in 1932-1933, and in 1935 rose to 180.

The index for steam locomotives, which reached a high of 248 in 1920, was 188 in 1935 as against a low of 168 and 166 in 1932 and 1933, a two-year period in which only 22 steam locomotives were purchased by American railroads, and a total of only 15 were built for common carriers. Other locomotives, including electrics and Diesels, show a more pronounced advance. Rails remain at a level of 123 as against a high of 168 in 1920, and a pegged price, making an index of 144, in the period 1925-1931, inclusive. Ties, which reached 201 in 1920

Regions I to VIII, Incl.

TABULATION OF INDICES BY YEARS AND BY ACCOUNTS APPLICABLE TO THE ENTIRE UNITED STATES

ROAD

Acct.	*Per Cent	1915	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32	'33	'34	'35
1	2.74	101	110	134	159	178	214	175	157	171	171	166	166	164	161	160	152	143	131	127	131	131
3	17.54	100	110	130	165	190	250	170	143	160	164	149	153	143	135	133	123	118	106	98	100	101
4	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	1.46	103	109	128	150	183	208	179	165	179	179	179	178	169	155	155	143	130	119	111	122	120
6	9.06	105	111	146	162	178	206	165	160	176	173	171	170	168	164	163	150	134	122	122	136	135
7	0.04	102	124	169	177	184	210	150	153	173	171	168	165	163	163	162	154	144	129	122	136	136
8	5.30	100	100	112	133	170	201	189	157	177	175	172	173	175	176	175	170	155	144	139	149	147
9	8.09	101	106	121	148	152	168	158	144	145	145	144	144	144	144	144	144	144	140	134	123	123
10	2.61	99	129	198	210	203	209	192	161	182	179	177	177	177	177	170	169	165	163	158	150	147
11	3.95	103	107	114	140	150	207	191	176	175	175	174	175	176	176	176	168	159	146	146	141	139
12	4.19	100	100	130	163	175	218	174	165	188	188	188	188	188	188	188	182	175	164	157	159	165
13	0.49	100	122	142	178	194	204	189	177	179	179	176	175	175	175	173	171	164	147	135	140	140
14	0.08	103	108	119	165	199	280	197	194	212	200	201	201	204	204	204	198	188	125	126	140	140
15	1.14	104	108	137	161	182	208	171	164	178	175	171	169	166	165	165	161	153	131	127	139	137
16	4.27	101	115	135	154	185	215	192	180	194	193	188	184	189	188	187	182	165	141	145	151	151
17	0.49	100	115	136	156	185	216	192	178	196	196	189	187	192	191	190	186	166	140	145	150	150
18	0.79	101	120	159	170	191	213	185	178	187	187	186	182	185	186	184	177	161	147	151	155	155
19	0.25	101	120	153	160	190	212	181	166	185	185	182	180	183	183	183	174	159	144	149	154	154
20	2.08	102	118	141	159	188	216	191	180	193	192	188	185	189	188	187	176	161	137	142	147	147
21	0.09	100	110	128	150	185	214	190	184	197	197	193	190	195	193	193	182	165	137	142	147	147
22	0.04	100	115	135	155	185	210	193	178	198	198	193	189	193	191	191	184	165	137	142	147	147
23	0.51	100	114	133	152	178	204	167	158	175	175	174	177	178	178	178	172	158	136	141	146	146
24	0.43	101	117	145	155	184	204	170	159	176	176	174	174	176	176	176	172	157	136	142	147	147
25	0.01	108	122	148	175	194	213	194	176	188	189	186	185	188	189	189	178	163	145	148	179	179
26	0.33	103	124	147	158	164	192	191	162	187	179	163	157	163	165	165	150	138	121	119	125	131
27	0.91	94	106	132	152	165	175	163	158	165	164	162	169	158	155	154	147	138	130	130	133	136
28	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	0.13	104	122	141	158	189	218	197	184	196	196	191	186	191	191	189	177	162	138	143	148	148
30	0.01	101	117	137	156	187	218	194	180	197	197	192	188	193	191	190	176	161	137	142	147	147
31	0.03	115	166	190	181	186	176	145	132	142	136	140	141	137	142	150	136	116	98	98	103	105
32	0.15	109	148	178	192	189	205	172	163	178	172	175	176	175	178	181	173	148	144	144	148	151
33	0.06	106	116	145	169	194	230	208	179	209	203	185	183	198	199	209	200	172	147	147	150	153
34	0.01	101	110	119	172	206	250	228	214	220	215	220	216	219	219	217	215	175	175	175	180	184
35	0.04	101	117	137	156	186	217	192	179	195	195	190	186	191	190	189	182	164	141	146	151	151
36	0.03	104	124	153	177	205	217	191	190	191	191	191	190	190	190	190	190	181	156	150	145	145
37	0.08	105	113	127	146	158	170	162	149	151	151	151	151	151	149	148	147	144	138	138	147	147
38	0.05	100	100	179	179	184	202	181	170	173	185	190	190	191	191	190	160	155	155	150	150	150
44	0.91	115	126	155	192	200	210	198	173	183	185	185	186	187	189	191	176	166	155	155	179	179
45	0.25	115	126	155	192	200	210	198	173	183	185	185	186	187	189	191	176	166	155	155	179	179
46	0.06	115	126	155	192	200	210	198	173	183	185	185	186	187	189	191	176	166	155	155	179	179
Wtd. Ave. 1–46	68.75	101	110	134	159	178	214	175	157	171	171	166	166	164	161	160	152	143	131	127	131	131

EQUIPMENT

Acct.	*Per Cent	1915	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32	'33	'34	'35
51	6.43	86	102	145	189	202	248	192	179	197	185	171	191	190	179	188	194	184	168	166	176	188
52	0.12	100	117	137	184	184	217	197	196	198	199	192	194	202	203	221	221	210	175	165	185	190
53	13.34	101	148	183	243	267	284	184	156	200	179	171	163	178	169	185	181	161	144	144	165	177
54	2.55	89	104	132	164	197	213	169	152	192	187	183	189	191	180	183	181	178	161	161	173	182
55	0.02	89	104	132	164	197	213	169	152	192	187	183	189	191	180	183	181	178	161	161	173	182
56	0.57	107	125	164	227	245	239	200	175	170	170	170	170	170	170	170	165	158	148	148	158	160
57	0.66	96	128	165	225	244	263	193	168	203	183	188	180	192	184	195	191	178	165	165	177	180
58	....	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Wtd. Ave. 51–58	23.69	96	130	166	219	240	265	185	163	198	182	173	174	183	174	186	185	170	153	153	169	180

GENERAL EXPENDITURES

Acct.	*Per Cent	1915	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32	'33	'34	'35
71–75 & 77	0.97	101	110	134	159	178	214	175	157	171	171	166	166	164	161	160	152	143	131	127	131	131
76	6.59	102	111	135	161	181	216	176	158	172	172	167	167	165	162	161	153	144	132	128	132	132
Wtd. Ave. 71–77	7.56	102	111	135	161	181	216	176	158	172	172	167	167	165	162	161	153	144	132	128	132	132

Acct.	*Per Cent	1915	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32	'33	'34	'35
1–46	68.75	101	110	134	159	178	214	175	157	171	171	166	166	164	161	160	152	143	131	127	131	131
51–58	23.69	96	130	166	219	240	265	185	163	198	182	173	174	183	174	186	185	170	153	153	169	180
71–77	7.56	102	111	135	161	181	216	176	158	172	172	167	167	165	162	161	153	144	132	128	132	132
Wtd. Ave. 1–77	100	100	115	142	173	193	226	177	159	177	174	168	168	169	164	166	160	149	136	133	140	142

* The percentages shown are the relationship in dollars of each individual account to the total of Accounts 1 to 77 inclusive except Account 2—Land, and were arrived at by taking 1910-14 dollars from the basic engineering reports with varying dates of valuation from 1914 to 1921 inclusive.

and struck a low of 139 in 1933, were up to 147 in 1935.

The bureau's indices are shown not only for the country as a whole, but for the eight regions in which the country is divided by the commission's statistics for railroads of the United States.

The indices shown for accounts which include items such as grading, tunnel, excavation, bridges, ballast haul and tracklaying and surfacing were developed from analysis of major construction contracts covering a period of over 30 years and from joint studies made with the various sub-committees of the Presidents' Conference Committee. The indices shown for material accounts such as ties, rails, other track material, ballast and fences were based on studies of carriers' returns to Valuation Order 14, joint studies made with the various sub-committees of the Presidents' Conference Committee, well-known engineering and trade publications, contracts covering major construction projects over a period of 30 years, and other information furnished by individual carriers.

The indices represent territorial index factors and are of value in indicating trends. They are not necessarily applicable for use in the determination of reproduction costs upon individual railroads, telegraph or telephone companies, or other utilities.

The accounts for which the indices are shown are the several primary accounts designated in the Classification of Investment in Road and Equipment of Steam Roads. The accounts are as follows:

I—ROAD:

1. Engineering
3. Grading
4. Underground Power Tubes
5. Tunnels and Subways
6. Bridges, Trestles and Culverts
7. Elevated Structures
8. Ties
9. Rails
10. Other Track Material
11. Ballast
12. Track Laying and Surfacing
13. Right-of-Way Fences
14. Snow and Sand Fences and Snowsheds
15. Crossings and Signs
16. Station and Office Buildings
17. Roadway Buildings
18. Water Stations
19. Fuel Stations
20. Shops and Enginehouses
21. Grain Elevators
22. Storage Warehouses
23. Wharves and Docks
24. Coal and Ore Wharves
25. Gas Producing Plants
26. Telegraph and Telephone Lines
27. Signals and Interlockers
28. Power Dams, Canals and Pipe Lines
29. Power Plant Buildings
30. Power Substation Buildings
31. Power Transmission Systems
32. Power Distribution Systems
33. Power Line Poles and Fixtures
34. Underground Conduits
35. Miscellaneous Structures
36. Paving
37. Roadway Machines
38. Roadway Small Tools
39. Assessments for Public Improvements
40. Revenues and Operating Expenses During Construction
41. Cost of Road Purchased
42. Reconstruction of Road Purchases
43. Other Expenditures—Road
44. Shop Machinery
45. Power Plant Machinery
46. Power Substation Apparatus
47. Unapplied Construction Material and Supplies

II—EQUIPMENT:

51. Steam Locomotives
52. Other Locomotives
53. Freight-Train Cars
54. Passenger-Train Cars
55. Motor Equipment of Cars
56. Floating Equipment
57. Work Equipment
58. Miscellaneous Equipment

III—GENERAL EXPENDITURES:

71. Organization Expenses
72. General Officers and Clerks
73. Law
74. Stationery and Printing
75. Taxes
76. Interest During Construction
77. Other Expenditures—General

Rock Island Plan of Reorganization

A PLAN of reorganization for the Chicago, Rock Island & Pacific, giving it an extremely flexible capital structure and providing for a reduction of 83 per cent in annual fixed charges was filed on July 15 in the Federal District Court in Chicago and with the Interstate Commerce Commission in Washington by E. N. Brown, chairman, on behalf of the directorate. Under the proposed plan, fixed annual interest charges would be reduced from $14,334,986 to $2,499,531. Capitalization, including bonds and stock would be reduced from $457,698,173 to $434,026,797. The corporate structure of the road would be simplified by the plan which proposes the conveyance of all properties of subsidiary companies, excepting the Rock Island Improvement Company, to the parent company. The present company will provide the basis for reorganization to minimize the expense of charter and qualification fees in the various states.

Securities outstanding after consummation of the plan would consist of $15,000,000 new first mortgage 3½ per cent bonds; $159,565,872 in new 4 per cent income bonds; $30,883,000 in 15-year equipment notes; $3,524,000 in Choctaw & Memphis 5 per cent bonds; $928,000 in Peoria Railway Terminal 4 per cent bonds; $17,529,706 collateral loans to the Reconstruction Finance Corporation and banks; $74,048,600 first preferred stock; $30,343,083 second preferred stock and $101,204,536 of common stock. This would make a total of $227,430,578 in bonds and $206,596,219 in stocks, compared with $328,805,661 and $128,892,512, respectively, at present.

The plan provides for a new issue of first mortgage bonds secured by a first lien on the entire property prior to all existing mortgages, which would be limited to refunding trustees' certificates. These bonds would provide necessary cash for consummation of the plan and funds necessary for immediate rehabilitation, including the initial payment on needed new equipment and for essential additions and betterments. The plan suggests that a minimum of $15,000,000—possibly $20,000,000—of these bonds will be required for immediate use and that the total issue be limited to $60,000,000. Of this $10,000,000 would serve as collateral for 4 per cent equipment notes proposed and the balance for future capital requirements.

A new general mortgage, open as to the amount outstanding, would be issued as 4 per cent non-cumulative 50-year income bonds. Initially there would be outstanding of these bonds $159,565,872 par amount which would be exchanged at varying ratios for $61,581,000 of present general mortgage 4's of 1988; $104,470,000 of first and refunding 4's of 1934; $11,000,000 of Burlington, Cedar Rapids & Northern 5's of 1934; $5,411,000 of Choctaw, Oklahoma & Gulf consolidated 5's of 1952; $11,000,000 of Rock Island, Arkansas & Louisiana first mortgage 4½'s of 1934; $9,983,755 of St. Paul & Kansas City Short Line first mortgage 4½'s of 1941, $453,600 of Rock Island, Arkansas & Louisiana and the Little Rock & Hot Springs Western notes of 1939 and $39,813,600 of the present secured series A4½'s. The new issue also would provide for future conversion, on an agreed basis, of $3,524,000 of Choctaw & Memphis consolidated 5's of 1952 and $928,000 of Peoria Terminal Company first mortgage 4's of 1937 which the plan presently would leave outstanding.

Equipment trust certificates in the amount of $11,-

662,000 will have matured by January 1, 1937, when the plan becomes operative, and the balance of $30,883,000 outstanding after that date will be exchanged for a like amount of new fifteen-year 4 per cent equipment notes.

In place of the present 7 and 6 per cent preferred stocks, two new issues will be created; a 4 per cent non-cumulative first preferred issue to be offered to holders of certain outstanding mortgages and a 4 per cent non-cumulative second preferred issue to be offered to the holders of the thirty-year convertible bonds and to general creditors.

New common stock will be issued for accumulated interest on the convertible 4½ per cent bonds and in exchange for present preferred and common stock. All classes of stock will have equal voting power.

Each 100 shares of the present 7 per cent preferred stock will receive 70 shares in new common stock, $100 par, and option warrants for 60 shares of common stock, while the 6 per cent preferred will receive 60 shares in new common and option warrants for 70 shares of new common. The present common stock will receive 40 shares of new common and option warrants for 60 shares of new common for each 100 shares held.

Income available for the payment of interest charges on the new general mortgage, when earned, would be after the following deduction: Interest on the new first mortgage bonds, the Choctaw & Memphis bonds, the Peoria Railway Terminal bonds, bank loans, R.F.C. loans and extended equipment notes and after expenditures, (not to exceed 50 per cent of the remainder, with a maximum of $2,500,000 in any one year), for necessary additions and betterments including initial payments on new equipment. As an alternative, the directors may retire at their discretion, underlying securities, floating debt or equipment notes. Capital expenditures for equipment and betterments shall not be funded.

Treatment of the present securities of the road will be on the following basis: The common stock, based on a par value of $100 a share, will be used in payment of interest on the bonds. General mortgage 4 per cent bonds will receive par for par of new general mortgage 4 per cent income bonds and $120 of new common stock. Principal of Choctaw & Memphis will remain undisturbed and receive $150 of new common stock. First and refunding 4 per cent bonds will get $500 of income bonds, $500 of first preferred stock and $70.30 of common for each $1,000 bond. Series A secured 4½ per cent bonds will receive $562.50 of income bonds, $432.84 of first preferred stock and $93.74 of common stock. Choctaw, Oklahoma & Gulf consolidated 5's will receive par for par of income bonds and $183.33 in new common. St. Paul & Kansas City Short Line 4½'s will secure $685 of income bonds, $315 of second preferred and $120.72 of new common. Burlington, Cedar Rapids & Northern consolidated 5's will receive $500 of income bonds, $250 of first preferred stock, $250 of second preferred stock and $93.75 of common stock. Rock Island, Arkansas & Louisiana 4½'s will receive $500 of income bonds, $250 of first preferred and $250 of second preferred stock and $86.25 of common. Convertible 4½ per cent bonds will receive $650 of second preferred stock and $391.25 of common, the latter including $350 for principal and $41.25 for interest. Bank and Reconstruction Finance Corporation loans will be extended to January 1, 1945, with interest at 3 per cent and equipment obligations will receive par for par in new 4 per cent equipment notes. The Peoria Railway Terminal bonds will remain undisturbed. General creditors of the road will receive second preferred stock at par in amount of adjudicated claims. It is estimated that $750,000 of the second preferred stock will be required for this settlement. Accumulated interest on the mortgage debt is secured equally with the principal under the terms of the plan.

In order to protect the interests of the present security holders in the property pending the restoration of normal earning power, it is proposed to give them a voice in the management through the creation of a voting trust. All of the new stock of the reorganized company will be issued to voting trustees. Participation certificates, with full and equal voting powers, will be issued with respect to new bonds and the new preferred and common stocks. Under the proposed plan the reorganized company would have to show earnings of $16,066,240 available for interest, preferred dividends, capital expenditures and sinking funds on the preferred but not considering $1,500,000 sinking fund on equipment notes which is provided through depreciation charges. Fixed interest will be $2,499,531, full interest on income bonds at 4 per cent, $6,382,635, dividends on first preferred, $3,001,944; first preferred sinking fund, $333,549; second preferred dividends, and $1,213,723; second preferred sinking fund, $134,858; while also to be retained by the company after first mortgage payment but before interest payment on income bonds is $2,500,000, making a total of $16,066,240 of fixed charges before any earnings can accrue to the common stock. On this basis there is a charge of $11,382,166 before preferred dividends and a charge of $14,717,659 before second preferred after providing for the first preferred requirements.

For R.F.C. loans totaling $13,718,700 there would be pledged the following collateral: $24,214,732 of new bonds, $4,753,000 of first preferred stock and $3,918,467 of second preferred stock, a total of $32,886,199. Bank loans in the amount of $4,125,000 will be secured by pledges of $8,768,490 of new bonds, $2,977,500 of first preferred stock and $2,663,010 of second preferred stock, a total of $14,409,000.

Eastman May Not Use Unexpended Funds

WASHINGTON, D. C.

FORMER Co-ordinator Joseph B. Eastman, after having spent three years making studies of methods for straightening out the transportation situation, is now probing the possibilities of federal red-tape in an effort to obtain funds for completing and publishing reports which were in process of completion when his office expired on June 16. Among these reports are the important series on the question as to the extent of public subsidies to various forms of transportation competing with the railroads, and the results of a study of railroad employment records, made as a basis for proposed pension and similar legislation, for which he had been given a special allotment of C. W. A. funds. R. N. Elliott, acting comptroller general of the United States, has rendered an opinion that Mr. Eastman may not use some $20,000 which he had on hand on June 16 of the funds assessed against the railroads for the expenses of his office, because the law provided that any unexpended balance should be returned to the railroads, although the Association of American Railroads had adopted a resolution favoring the use of the money by the co-ordinator to complete the reports.

In a letter dated July 3 Mr. Eastman had asked the

comptroller general's office for a ruling as to whether he could use the unexpended balance, and President Roosevelt has also asked the Budget Bureau whether it can find some source from which funds may be allotted for the purpose. After citing provisions of the emergency transportation act, of which Title I ceased to have effect at midnight June 16, Mr. Eastman said:

"At that time an amount not exceeding $12,000 had been definitely obligated with the Government Printing Office for the printing of certain reports of the Co-ordinator, and part of the copy for such reports was in the hands of the Government Printing Office. The actual cost of printing is likely to fall considerably short of this $12,000. Assuming that it is all so used, however, the unexpended balance returnable to the carriers is estimated as at least $20,000, and probably somewhat more. Certain unaudited items make it impossible to state the exact amount.

"Until a short time before the adjournment of Congress, it seemed possible that Title I of the Emergency Act would be extended for another year. When it became clear that this would not be done, a Joint Resolution was proposed enabling the Co-ordinator to continue for 90 days with the funds at hand for the purpose of completing and publishing reports which on June 16 were in process of completion. It proved impossible, however, in either the House or the Senate, to bring this Joint Resolution up for vote, so no action was taken.

"On June 16th, certain important reports undertaken by the Co-ordinator in accordance with the duty imposed upon him by the Act were pending and incomplete. The reports in question have to do principally with the public aid given to the various forms of transportation—railroads, water lines, highway carriers, and air carriers, and with labor standards of these transportation agencies other than the railroads. The investigations into these matters were instituted because of the claim, so often made by the railroads, that they are subjected to unfair competition because of the public aid given, directly or indirectly, to their competitors and because of the low labor standards maintained by these competitors. There has been so much controversy over the facts that it seemed desirable to go to the bottom of them, if possible.

"Three years have been spent on these studies, which proved to be of great magnitude and difficulty. As a check, the plan has been followed of sending out copies of the reports in tentative form to those known to have given attention to these matters on one side or another, for comment and criticism. This endeavor to leave no stone unturned in the pursuit of accuracy has been one main reason for the delay in completing the reports. An enormous amount of data has been accumulated and the reports are now near to final form. It would be a calamity if they could not be published. Every effort was made to complete the work in hand by June 16, and the greater part of it was completed by continual and uncompensated overtime work on the part of the Co-ordinator and his staff for a long period of time. It proved impossible, however, to complete all of the work, because of its magnitude. Since June 16, however, work on the incompleted reports has gone on, thanks to the loyalty of a staff which is willing to take the chance that it may receive no pay.

"There is involved in addition to the cost of the work required in completing and printing the reports which were in process of completion on June 16, the cost of closing up branch offices maintained by the Co-ordinator in New York, N. Y., Chicago, Ill., and Atlanta, Ga., the leases of the office space for which were cancelled on June 16. They contain valuable furniture and records which must be moved to Washington. The funds unexpended will be sufficient to take care of this expense and also of the expense of completing and printing the reports which were in process of completion on June 16, 1936."

On June 26, 1936, he said the board of directors of the Association of American Railroads unanimously adopted a resolution stating that it was the sense of the board of directors that the unexpended funds "can with benefit to the public interest be used to defray the expenses of completing" the studies in question. It recommended to all members of the association that each "waive its right to any refund of its proportion of the said unexpended funds in the Treasury of the United States, assessed to pay the expenses of the co-ordinator, and take such further steps as may be necessary to permit the former co-ordinator to use such member's proportion of the said unexpended fund for the purpose of completing his unfinished studies and making reports thereon."

The co-ordinator has also been given assurance that whatever may be necessary in this respect will be done, and he has been given assurance also by the president of the American Short Line Railroad Association, whose members are not generally members of the Association of American Railroads, that there is every probability that similar action will be taken by the members of his association. The short lines contributed about 5 per cent of the total. While the matter has not been taken up with the American Transit Association, some of whose members (electric railways) were assessed in very minor amounts, no difficulty is anticipated in securing similar action from them.

"This action, or contemplated action, on the part of the railroads," Mr. Eastman said, "is important as indicating that no one can possibly be hurt if the unexpended funds are used to finish this work. Those who might otherwise have a claim to the funds do not want them, but on the contrary wish them used to finish the work. They agree, and all must agree, that the public interest will be served if they can be used in this way. The case is plainly one which calls for the exercise of sound judgment and common sense, with minimum regard for technicalities.

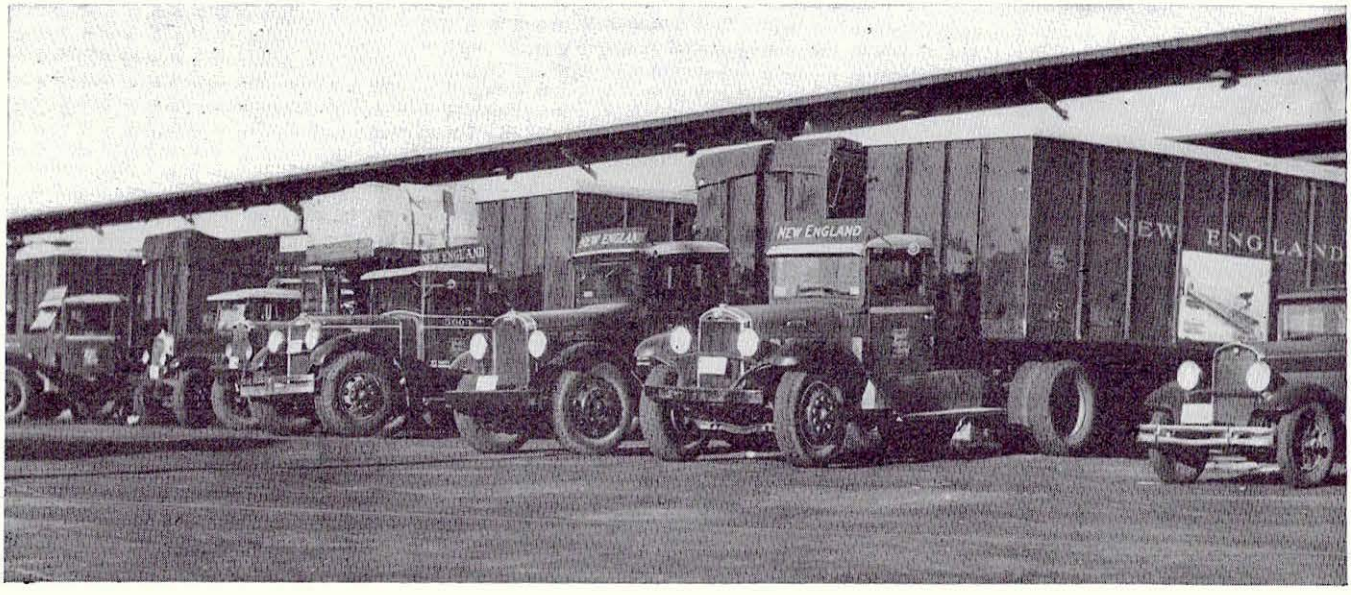
"Moreover, there is no danger of an undesirable precedent. The situation is, I understand, wholly novel. Nothing like it has arisen before, or is at all likely to arise again. Principles should be followed like those in equity, as distinguished from law, in order that there may be done what clearly ought to be done.

"The Act did not intend that moneys which were necessary to carry out its purposes should be returned to the carriers. While the Act ceased to have effect on June 16, 1936, it is impossible to bring to an abrupt close work of the extent and magnitude which had been undertaken. Clearly no new work could be begun after June 16, nor any work beyond what was necessary to wind up the affairs and business of the co-ordinator in short order. But it was within the reasonable contemplation of the Act that what was necessary for the latter purpose should be expended.

"It is a sound construction of the Act that the funds on hand on June 16 were *obligated* for the purpose of protecting the records and other property of the co-ordinator's office and to complete work which had already gone so far that waste, improvidence, and sacrifice of the public interest would plainly result, if it were not completed. It is submitted that no other conclusion can reasonably be reached, not only with respect to the records and other property, but also with respect

(*Continued on page 157*)

Motor Transport Section



A Line-Up of New England Transportation Company Trucks

New Haven Bus and Truck Subsidiaries Work Together

Inter-company co-operation and services received from railroad bring operating economies

THE New York, New Haven & Hartford, now operating buses and trucks through ten subsidiaries, has found in that set-up many opportunities for the promotion of more economical operations through inter-company co-operation and centralized control. While generally pictured in their subordinate roles as auxiliaries to the parent railroad, the New Haven's highway affiliates in fact constitute a major transportation enterprise—earning more in gross revenues than many Class I railroads. At the close of 1935 they owned 1,197 units of highway equipment exclusive of 122 service cars owned by the railroad itself. The subsidiaries providing highway services exclusively reported for last year gross revenues of $4,445,000 while $3,610,400 was, in addition, collected from the bus and truck operations of other affiliates which also provide electric railway services.

The New Haven's highway subsidiaries are: The New England Transportation Company and its four subsidiaries—the Victoria Coach Line, Inc., the Berkshire Motor Coach Lines, Inc., the I. R. T. Co., Inc., and the Providence-Hartford-Norwich Lines, Inc.; the County Transportation Company, a subsidiary of the New York & Stamford Railway Company, which is now a non-operating company, having abandoned its street railway operations in 1927; the Soundview Transportation Company, a subsidiary of the New York, Westchester & Boston; and the Berkshire Street Railway Company (not to be confused with the above-mentioned Berkshire Motor Coach Lines) which now operates only bus services. Also, the Connecticut Company and the Springfield Street Railway Company, which operate both trolley and highway services.

In addition to various co-operative arrangements among themselves much work is done for these subsidiaries by the New Haven. The railroad does the accounting for the Connecticut Company, the Springfield Street Railway Company and the Berkshire Street Railway Company. Its purchasing agent is also purchasing agent for all the highway affiliates, although buying is not pooled, the orders being placed in the name of the individual companies. All legal work for the subsidiaries is performed by the New Haven's legal department. Also, the railroad's statistics and research department is providing survey, research and other services to the subsidiaries.

Among the latter is the centralized control of equip-

ment maintenance which assures the carrying out of inspection and repair schedules. In this connection there is kept an individual vehicle record upon which are entered daily the mileages made by the individual units of equipment, as reported by cashiers throughout the highway systems. The inspection and maintaince schedules have been scientifically worked out to require that certain specified inspections and repairs be made when a unit has run various specified mileages. When the record shows that a vehicle has been operated a mileage

largest bus and truck operator among the New Haven's affiliates, although the Connecticut Company, which has 434 highway vehicles, including six leased from the County Transportation Company, is a runner-up. N. E. T. and its subsidiaries, however, owned 589 vehicles on December 31. The New England does all accounting work for itself and its subsidiaries and also for the County Transportation Company. Also it maintains a large repair shop at Providence, R. I., where it repairs vehicles of its subsidiaries and those of its own which

Motor Vehicle Equipment Owned by the New York, New Haven & Hartford and Subsidiaries

(Figures as of December 31, 1935)

	Coaches	Sedans	Passenger Cars	Express Trucks	Trailers	Tractors	Service Trucks	Total
New England Transportation Company	222	30	15	102	88	58	13	528
Victoria Coach Line	13	..	..	..	..	..	..	13
Berkshire Motor Coach Lines	10	9	..	..	..	..	..	19
I.R.T. Company	13	7	..	..	..	..	..	20
Providence-Hartford-Norwich Lines	1	8	..	..	..	..	..	9
Connecticut Company	354	..	11	20	..	..	49	434
Berkshire Street Railway Company	39	4	..	..	..	..	2	45
Springfield Street Railway Company	61	..	3	..	1	..	12	77
County Transportation Company	49	..	1	..	..	..	2	52
New York, New Haven & Hartford R. R. Co.	..	..	19	..	..	..	103	122
	762	58	49	122	89	58	181	1,319

calling for its submission to one of the scheduled inspections, a form serving notice of this fact is forwarded to the proper mechanical officer. The latter, when the specified inspection and repair routine has been covered, makes a notation to that effect on the same form and returns it to the statistics and research department. Through this systematic attention to the condition of vehicles it is felt that the maximum service is secured from them at a minimum cost.

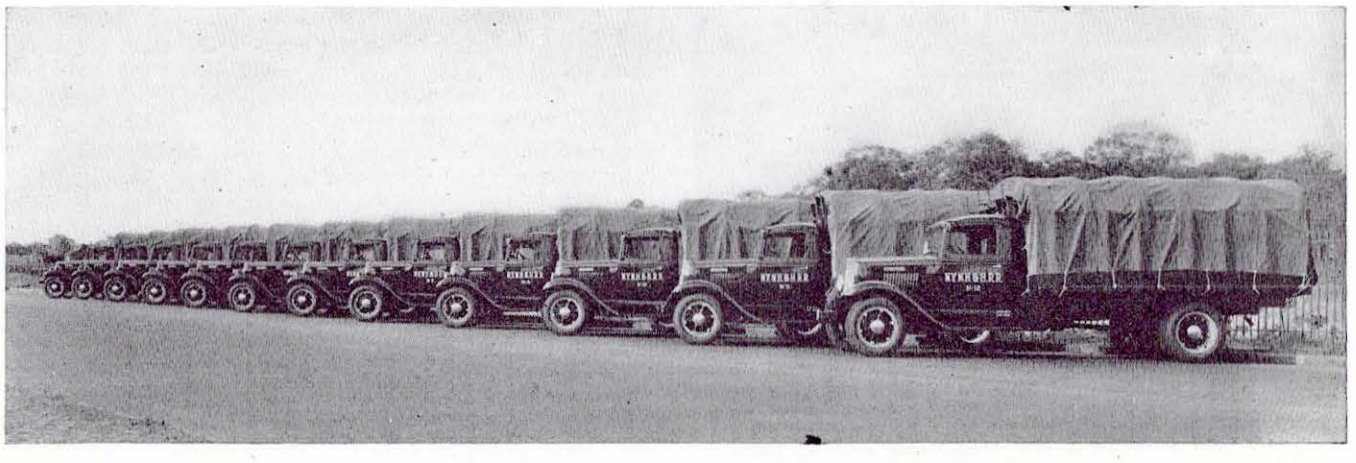
In addition, in October, 1935, a plan of unit accounting for each piece of equipment was installed. As this record develops it will provide data on repair costs, indicating the most suitable types of buses and trucks for the various services, and should also furnish information for an intelligent decision as to when to stop repairing and replace. Also, there is the analysis of daily tonnage and performance by truck routes. This record shows the capacity of the vehicle, the total tonnage carried and its peak loads, inbound and outbound. The latter over a period of time should indicate the capacity of trucks required to cover particular routes. Another survey is that of the train-replacement routes operated by the New England Transportation Company. This is designed to work out a fair basis upon which to compensate the N. E. T. for these services.

The New England Transportation Company is the

are assigned to the eastern part of its territory. The Connecticut Company, however, inspects, maintains and makes heavy repairs to equipment of the N. E. T., operating in the state of Connecticut; such equipment is housed at Connecticut Company garages when not in service. In addition, if a breakdown of the N. E. T. equipment occurs in the territory served by the Connecticut Company, the latter provides substitute vehicles in emergency cases to avoid delay to passengers.

Many N. E. T. and Connecticut Company truck routes are co-ordinated so as to avoid duplication, and also these companies can obtain equipment from each other to care for peak freight or passenger movements. The Connecticut Company truck routes are substitutes for former express trolley services—the New Haven has used only the N. E. T. as a train-replacement agency.

In addition to its arrangements with N. E. T. the Connecticut Company does, in its New Haven shop, the bulk of repairs on equipment of the Berkshire Street Railway Company. The latter serves Williamstown, North Adams, Pittsfield and Great Barrington and intervening territory in Massachusetts; also it operates interstate between Pittsfield, Mass., and North Adams, and Bennington, Vt. Some of the New Haven's own service trucks and automobiles are serviced by the Connecticut Company, although the railroad's own mechan-



A Group of Internationals Comprising Part of the New Haven's Maintenance of Way Fleet of 103 Trucks

ical forces do this work on trucks used in the maintenance of way operations described in the *Railway Age* of December 7, 1935, page 747.

The County Transportation Company, providing on its own account bus services in Westchester County, New

Bus Used on Long-Distance Routes of the New England Transportation Company

York, and adjoining Connecticut territory, also operates under contract the routes of the Soundview Transportation Company. It has 49 buses, excluding the six leased to the Connecticut Company. As stated above the N. E. T. does the County's accounting but the latter does its own maintenance work in its large garage at Port Chester, N. Y. The Springfield Street Railway Company services its own highway vehicles in its shop at Springfield, Mass.

All of the foregoing inter-company services and co-operative arrangements are provided on the basis of cost, including actual cost of labor and materials, plus an agreed overhead. In addition, the traffic departments of

One of the Connecticut Company's Buses

the various companies maintain continual contact in order to keep their solicitation activities co-ordinated to the point where no business is lost that can be handled by any of them.

Rail-Highway-Ship Co-ordination in New Zealand

BECAUSE of the long, narrow shape of the two islands comprising New Zealand, practically every traffic movement there has faced rail and steamship competition for years. With the advent of hard-surfaced highways, however, this became a three-way competition, and a chaotic transportation situation resulted that was harmful for all the transportation agencies concerned.

To eliminate this condition, steps have just been taken to restore freight handling between the principal points to something like normality, by assigning to each agency such traffic as it is best fitted to handle. The New Zealand State Railways have entered into an arrangement with the trucking companies whereby the latter provide storedoor service, and, where most efficient, station-to-station service, in conjunction with rail move-

Railway-Owned Bus Climbing One of New Zealand's Many Hills

ment from and to the distribution points. Freight trains have been accelerated so as to provide overnight delivery from and to all points.

The rate situation, hitherto on a ruinous price-cutting basis, has been stabilized to give each agency, including the ships, the proper revenue for the service performed.

In addition to contracting for motor truck transportation, the New Zealand Railways, at the close of the fiscal year ended March 31, 1935, were operating six bus routes. Gross revenues from these highway services, for the year ended March 31, 1935, totaled £90,278, an increase of 14.01 per cent over 1933-34. Meanwhile operating expenses had increased but 10.14 per cent, so that the 1934-35 net revenue was £5,672 as compared with £2,368 in 1933-34.

The total highway fleet comprises 49 buses and 10 service cars. The latest acquired are five 21-passenger de luxe buses which "conform to the modern trend towards streamlining," and in which "special provision has been made in the seating to ensure every comfort on long-distance trips." The chasses for these were purchased in England and the bodies were built in the railways' own shops, as were the bodies of all other units of the fleet.

Winning Back Merchandise Traffic

Texas & Pacific proves it can be done by careful study and revision of schedules and by rail-highway co-ordination

THE Texas & Pacific, through its wholly-owned subsidiary, the Texas & Pacific Motor Transport Company, may lay claim to being the first steam railway in the country to have provided collection and delivery service, having started such service on September 9, 1929. This step was taken before the depression had arrived to convince many railway officers that merchandise traffic creates a valuable adjunct to revenues. It was one measure in a consistent campaign of the railway not only to hold what merchandise traffic it had, but to increase this type of traffic.

Even before that time, the T. & P. had begun the operation of fast merchandise trains, co-ordinated with early morning local trains, that brought overnight service with early morning delivery of merchandise from practically every jobbing center on the T. & P. to the towns those jobbing centers serve. In view of the distances in Texas, the provision of such service required considerable study. For example, it is 298.8 miles from Dallas to Big Spring; yet the overnight merchandise train which leaves Dallas at 8:30 p.m., after the last pick-up trucks are in, picks up more merchandise cars at Ft. Worth and sets out cars at several of the larger points, and arrives in Big Spring at 8 o'clock the following morning. Similar service is also operated east out of Ft. Worth and Dallas, arriving in Texarkana at 5:15 a.m., and serving the principal intermediate stations enroute. The results obtained from a traffic standpoint have amply justified the necessary attention and care.

Improving Merchandise Handling

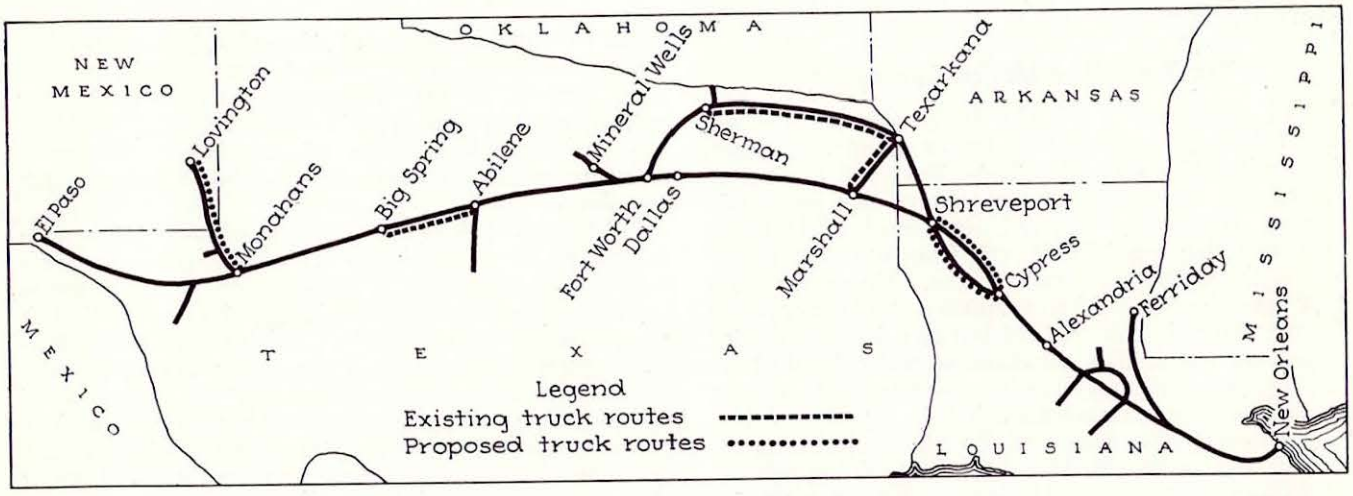
The Texas & Pacific has felt that the best results could only be obtained by making some one person responsible for merchandise traffic and for initiating improvements in merchandise handling. Accordingly, a general merchandise traffic agent was appointed some years ago, who serves also as general freight agent of the highway subsidiary, the Texas & Pacific Motor Transport Company. This general merchandise traffic agent reports directly to the vice-president in charge of traffic for the railway, who is also vice-president of the transport company. A number of solicitors are employed to concentrate on merchandise traffic and these men report to the general merchandise traffic agent. In developing this l.c.l. traffic, the shipper's desires have been carefully studied and an effort has been made to meet his requirements and wishes.

The provision of pick-up and delivery service presented a number of problems at its inception, but with more than 6½ years' experience along these lines, the T. & P. has been able to work them out satisfactorily. Local draymen are employed for this purpose at most points and, as they have gained experience, they have proved valuable in the solicitation of freight for the railway and for themselves. At many points in Louisiana, however, there were no draymen in the towns, despite the fact that a considerable merchandise traffic moves to the plantation stores there. At such points, the local railroad agents have been given the pick-up and delivery contracts. Since one or two plantation stores are the only ones in town which receive merchandise, the agent's task is simplified. These agents are paid the regular contract allowance on all freight they deliver, and they make deliveries in everything from wheelbarrows to their own automobiles.

Accelerating Paper Work

The problem of speeding up paper work has received much attention on the T. & P. Motor Transport Company. The multiple waybill system has been adopted, under which a carbon copy of the original waybill also serves as a delivery receipt.

An interesting development along these lines has been the establishment of "grocery mixture" rates, intrastate in Texas, which apply one average rate on all the thousands of items usually included in grocery shipments. Such shipments were formerly a "nightmare" to bill clerks and auditors, sometimes requiring enormous waybills showing from one to two thousand items at various rates. The huge amount of paper work involved was a



The Texas & Pacific Intends to Increase Its Rail-Highway Co-ordination on a System Basis

fruitful source of overcharge claims, and the entire proceeding was such a nuisance to the shipper that grocery shipments had largely gone over to highway competitors. Under the present system, however, the checker simply checks in so many pieces of "grocery mixture," regardless of whether these pieces are brooms or soap boxes. The waybill is prepared in the same simple fashion.

This innovation has proved popular with the grocery jobbers, and grocery shipments now represent an important item in T. & P. traffic and revenues. This particular feature has been in effect for 18 months and not only are claim payments on grocery shipments less than they were formerly, but claims on this commodity are now less than on most other commodities.

As a further service to the shippers and also to eliminate much unnecessary correspondence, each T. & P. agent has been authorized to issue a check to the shipper or receiver at once to cover loss and damage claims on merchandise traffic, assuming that the claim is properly supported and the amount is not unusually large. This eliminates much paper work and produces good feeling among the shippers.

Truck Lines Operated

The friendliness generated by this care and attention to merchandise traffic is expressed not only by routing much l.c.l. traffic via the Texas & Pacific, but in other ways as well. The Texas & Pacific Motor Transport Company is planning to increase its truck service in Texas by station-to-station operations between Abilene and Big Spring, between Marshall and Texarkana, and between Sherman and Texarkana. At the hearings before the Texas Railroad Commission on these applications, more than a hundred witnesses from among the shippers and receivers appeared in behalf of the T. & P. Motor Transport Company.

The truck lines already in operation have been entirely successful. In Louisiana, the two lines of the railway between Shreveport and Cypress are both served by transport-company-owned and operated trucks, so far as merchandise traffic is concerned. A fast overnight merchandise train is operated from New Orleans to Shreveport, 322 miles, nightly from which merchandise for the stations on the two lines is loaded on trucks that leave Shreveport in the early morning, one operating via Lucas, Howard, Grand Bayou and Natchitoches to Cypress, and the other via Keithville, Gloster and South Mansfield to Cypress. These two truck lines were established in September, 1935, and there has been a steady growth in the amount of merchandise handled since that time, despite the fact that there are three other competing truck lines in the same territory.

The Texas-New Mexico Operations

Until the Texas & Pacific Motor Transport Company began the operation of trucks along the branch of the railway between Monahans, Tex., and Lovington, N. M., 112 miles, merchandise was handled on a train operated on alternate days and, since much of the traffic came from Dallas and Ft. Worth, from 400 to 500 miles distant, the service was rather slow. Under the daily truck operation, from 12 to as much as 96 hr. are saved. The merchants in this oil-field territory have responded to such an extent that merchandise traffic handled for stations along this branch has increased over 300 per cent since truck operations were started.

This merchandise leaves Ft. Worth and Dallas in the evening and arrives at Monahans in time for delivery the following afternoon. However, since the afternoon and evening are the merchants' busiest time in this territory, with the drillers and other oil field employees leaving their work at this time and coming to town to shop, the merchants have requested that their freight be held and not be delivered until the following morning.

Not a little of the l.c.l. freight consists of pipe and other oil well supplies which are awkward to handle manually. Freight of this character is loaded on trucks equipped with winches, which materially facilitate unloading and make it much less expensive.

In this operation, too, paper work has been simplified. On all merchandise originating on the T. & P., under the multiple system described previously, delivery receipts are ready in the form of carbons of the waybill. For merchandise originating on foreign lines, however, the preparation of delivery receipts is necessary. The waybills are sent to Monahans by passenger train, arriving three or four hours ahead of the freight. A revising clerk, who covers the entire branch, is employed at Monahans, and he prepares the delivery receipts and such other paper work as is necessary, so that the merchandise may move out along the branch by truck shortly after its arrival, without being delayed for the essential paper work.

Local Truckers Propose Unified Pick-Up Plan

THE National Local Trucking Associations, representing operators engaged in strictly local service and as terminal units, has announced that it will develop a unified national program for local collection and delivery service, co-ordinated to serve rail, air, steamship and over-the-road highway carriers. This announcement was made by Philip A. Smith, Jr., of Chicago, president of the association.

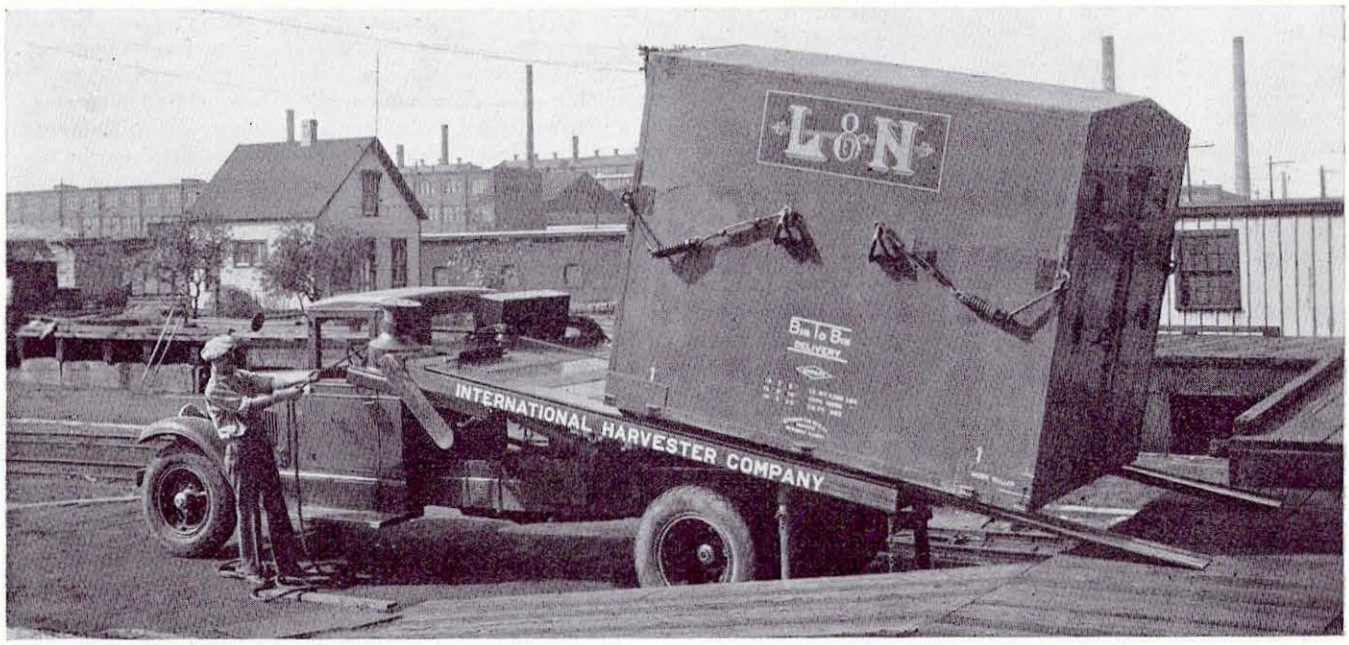
"As the initial step," he said, "the association will set up a national planning committee, with Eugene P. McNeil of Chicago, as chairman. Vested with authority to proceed with the program as rapidly as possible, this committee, which will be representative of local truck operators in all parts of the United States, has been called to meet in Chicago early in August, to lay the groundwork for submitting its recommendations to all transportation agencies, as well as shippers and other interests concerned."

Pointing out that local truck operators, with years of experience in the expeditious handling and routing of traffic for shippers, and with a knowledge of methods to assure maximum service and economy to shippers and other carriers, in turn advantageous to the public, are best equipped to solve the pick-up and delivery problem, Mr. Smith declared that the association will move promptly in adopting and recommending a program for its solution.

"Pick-up and delivery service is of vital importance in any effort to eliminate duplicated service and resultant economic waste through a co-ordinated transportation system. However, it must be in accord with sound transportation economy, which will preserve individual enterprise, as against monopoly; and assure adequate transportation charges, with a compensatory division among all agencies performing the service. The public interest is not served when rates are lowered for one unit of a complete service and the loss made up in higher rates for another."

A New Type of Container

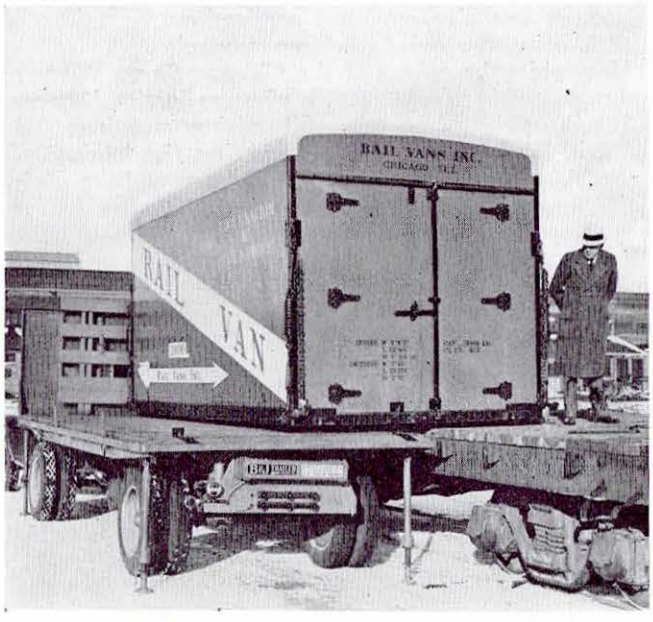
AT THE suggestion of former Co-ordinator Eastman, a new container, intended to meet modern transportation conditions in which both motor trucks and railroad cars are essential features, has been developed by George R. Meyercord, president of the Haskelite Company; by the International Harvester Company, which developed a truck for the container; and by the Mount Vernon Car Manufacturing Company, which manufactured the plywood and steel containers.



The Truck Has a Movable Flat Deck Which Can Be Elevated and Tilted by Motor Drive

The Tests

Most of the tests of this container have been made in Chicago, but they have also been conducted in St. Louis, Fort Wayne and Philadelphia, with a view to establishing quick and easy transfer from factory shipping rooms or grain warehouses to trains, and for loading from the ground in fields and orchards to trucks. Tests have been made also for the purpose of providing the strength and durability of the container and for developing a practical means of absorbing shocks or impacts.



The Container Can Be Moved Sideways from Flat Car to Truck

Structure and Capacity of Containers

These containers are anchored to the rail cars by shock-absorbing devices consisting of coil springs, so that less than half of the car impact is transmitted to the cargo. It is claimed that sewer tile, which is almost as fragile as eggs under certain conditions, can be shipped with safety in these containers for long distances, as a result of the shock-absorbing features. The containers are equipped with air-operated wheels, on which they are elevated while being transferred between freight cars and trucks, and these wheels are retractable, so as not to be in the way during shipping.

The size of the containers is such that five of the standard units can be loaded on each railroad car. They are of weather-tight construction and are also dust-proof. Three sizes have been built to date. The smallest is of 304 cu. ft. capacity, with an empty weight of 1,760 lb., and a load capacity of 10,000 lb.; the intermediate size has a capacity of 493 cu. ft., with an empty weight of 2,280 lb., and a loaded capacity of 15,000 lb., while the largest size has a capacity of 823 cu. ft., with an empty weight of 2,900 lb., and a loaded capacity of 20,000 lb. The containers are built of steel and a special plywood, and are equipped with large double doors at the ends.

The Specially-Built Motor Truck

The International Harvester Company truck built for these units has a movable flat deck which can be elevated and tilted by motor drive. By using a motor-driven capstan or winch and cable, the containers can be moved from street level on or off the truck platform. The capstan is also used to move the containers laterally from the truck platform to the railroad car. The important departure in this design is that the container can be moved sideways from the truck to the flat car.

Bureau of Motor Carriers Showing Increased Activity

WASHINGTON, D. C.

THE Interstate Commerce Commission's Bureau of Motor carriers is showing almost daily evidence of its constantly increasing activity in carrying out the numerous phases of the multifarious duties imposed on it by the motor carrier act, but various notices and orders that have been issued recently by the commission show that there are still many motor carriers that have not yet learned to take the law seriously. One of the first problems faced by the commission after the law became effective last year was that of building up its organization to administer it and this has not yet been entirely completed, although announcement has been made of the appointment of district directors and district supervisors for most of the 16 districts which the commission will maintain in the field and many of the field men have already gone to work. Their principal duties will be to contact motor carriers locally in the effort to disseminate information as to what is expected of them and to co-operate in educational work. Some of the district offices have been opened but in some districts there have been delays awaiting receipt of appropriate equipment.

Some 75 joint boards of state representatives have already been organized and a large number of hearings on applications of various kinds have been assigned to them. In addition to some 100,000 applications for certificates or permits under the "grandfather clause" there are approximately 1,000 applications for certificates and permits on which hearings have to be held. Already a number of recommended reports have been made by joint boards or examiners, accompanied by the form of an order to become effective in 20 days unless exceptions are filed, in which case they must be passed on by the commission. In most cases so far exceptions have been filed, so the reports have not gone into effect but in one important case, the application of the Pennsylvania Truck Lines, Inc., for authority to acquire control of the Barker Motor Freight, Inc., although no exceptions were filed to the report recommending that the application be granted, the commission itself issued a stay order on its own motion.

The motor carrier bureau has released for criticism and comment its proposed rules and regulations to promote safety of bus and truck operation which are being submitted to a large number of organizations and individuals before they are submitted to the commission for its consideration, and a proposed draft of the accounting requirements has been the subject of many conferences, under procedure somewhat similar to that applied to the proposed insurance regulations. The latter have reached the stage of a hearing.

Because so many contract carriers have been filing with the commission schedules of minimum rates so low that they were not used, while "dickering" with their customers for the actual rates charged, Division 5 of the commission has issued an order requiring such carriers to file with the commission and to keep open for public inspection copies of the actual contracts with shippers covering the rates charged. It is believed that this requirement will also reveal that a number of carriers have been trying to escape the more specific regulation provided for in the law for common carriers by posing as contract carriers. The order states that the filing by every contract carrier by motor vehicle of copies of contracts containing the minimum charges of such carrier is, in the judgment of the commission, necessary and desirable in the public interest and that the discretion of the commission, vested in it by Section 218(a) of the motor carrier act, should be exercised. Such contracts are to be filed by October 1 and kept open for public inspection in the form and manner prescribed in Tariff Circular MF No. 1 and Tariff Circular MP No. 2, so far as the provisions of the circulars are applicable. In case the contract is an oral one, the order requires a memorandum containing an accurate and complete statement of the substance and terms, acknowledged in writing by each party to the contract.

Shortly before this order the commission had issued notices saying that it had been informed that many motor carriers were not adhering to their published rate schedules and were issuing passes and giving free transportation in violation of the law. Attention was called to the applicable provisions and, while it was stated that probably many of such violations were due to lack of information, warning was given of penalties provided in the act.

Freight tariffs filed with the commission by the truck operators are understood to be in a rather chaotic state but numerous meetings have been held under the auspices of the trucking organizations in efforts to improve and centralize the tariff-publishing organizations. Less difficulty has been experienced with bus tariffs, as the bus companies had already learned something about adhering to fixed tariffs, but numerous changes in bus rates have been made necessary in the eastern district to meet the competition created by the reduced railroad fares ordered by the commission which became effective on June 1. Tariffs containing fairly general reductions in eastern bus fares to meet the rail rates were filed to become effective at that time and since then some of the lines operating in the territory between New York, Philadelphia, Baltimore and Washington have made a second reduction.

The number of controversies between railroads and truckers as well as between truckers themselves which are being developed under provisions of the motor carrier law is increasing daily. The principal one between the railroads and the truckers is that over store-door delivery, now the subject of hearings before commission examiners. In other cases protests have been made against rate tariffs filed asking the commission to suspend them and in still others railroads are opposing applications by trucking companies for authority to extend their operations by acquiring others while truck companies are also opposing applications by railroads for authority to acquire trucking companies.

Meanwhile the efforts of the Chicago Great Western and other roads to effect a plan of co-ordination between rail and truck service are still raising questions. A Chicago Great Western tariff covering the haulage of trucks, loaded or empty, between Chicago and the Twin Cities, has been allowed to go into effect after having been suspended, but another plan, of publishing joint rail and truck rates, is still under suspension and is to be the subject of argument before the commission on July 31.

The Bureau of Motor Carriers has announced the opening of its district offices for the 6th district in Atlanta, Georgia, on July 20. District Director F. P. Morgan will be in charge. Additional offices were to be opened on July 27 as follows:

District No. 5—Charlotte, N. C. District Director, Sam C. Blease, in charge.

District No. 7—Nashville, Tenn. District Director, Herbert Qualls, in charge.

District No. 9—Minneapolis, Minn. District Director, W. E. Hustleby, in charge.

District No. 11—Little Rock, Ark. District Director, Ray G. Atherton, in charge.

"I Drive Safely"

UNDER the above title, the International Harvester Company has issued a 60-page booklet, giving in condensed form the results of many years' study on the part of its safety engineers.

The booklet contains a wealth of information concerning safe highway operation, and should be of particular interest and value to those charged with the safe operation of the highway subsidiaries of the railways, on which efforts are being made to maintain the high degree of safety attained by the parent railways.

"I Drive Safely" comprises a complete summary of highway safety practices, dealing with such matters as speed, brakes, steering, hilly roads, slippery roads, congested traffic, tires, vision, lights, lubrication, mechanical equipment and garage accident factors.

The table of stopping distances under ideal conditions of brakes and road surfaces is particularly interesting as follows:

Vehicle speed in miles an hour	Distance traveled (in feet) during period of driver reaction up to moment brakes are actually applied. *Average Time 1 Sec.	Distance traveled (in feet) from moment brakes are applied to full stop. (Rate of deceleration 22 feet per second, per second)	Total distance traveled (in feet) from moment driver reacts to apply brakes to full stop where reaction time is 1 sec.
10	14.7	4.8	19.5
20	29.3	19.5	48.8
30	44.0	43.9	87.9
40	58.7	78.2	136.9
50	73.3	122.2	195.5
60	88.0	175.9	263.9

* This amount of time varies from ½ sec., where driver is prepared to stop, as in approaching a traffic signal, to as much as 3 to 4 sec., where he is confused or undecided.

Copies of the booklet may be obtained without charge by writing to the International Harvester Company, 606 South Michigan avenue, Chicago.

National Trailways Builds Terminals

CONTINUING their announced policy of terminal improvement, the member lines of the National Trailways have recently announced plans for the construction of new terminals in San Francisco, Cal., and Chicago.

The Burlington Transportation Company and the Santa Fe Trails will construct a $150,000 union bus terminal at 12 East Randolph street, Chicago, the property having been leased from the owner beginning July 1. The present building on the property will be wrecked beginning August 1 and will be replaced by a two-story bus terminal. It is anticipated that 12 other bus lines will use the new union station, including the Greyhound, the Great Eastern, the Indian Trail, the Interstate Transit, the De Luxe, the Reindeer, the Blue Bird and the Southern Limited. The first floor of the new terminal will contain an air conditioned waiting room, with a lunchroom adjoining and a barber shop and restrooms on a mezzanine floor. The second floor will be used as general offices. Completion is scheduled for late in the fall.

The Atchison, Topeka & Santa Fe has announced the purchase of the Argonaut Hotel property, in San Francisco, as a site for a downtown bus and rail terminal. Half a million dollars will be expended by the Santa Fe to raze the old hotel building and erect a modern, joint bus-rail terminal. Heretofore passengers arriving via the Santa Fe at the Oakland depot have been transported by ferry to San Francisco. With the completion of the new terminal, the Santa Fe will provide a bus service over the San Francisco-Oakland bay bridge to connect the two cities. The building will serve also as a central operations point for the Santa Fe Transportation Company, a Santa Fe affiliate, which operates a fleet of passenger buses. The Santa Fe expects to take possession of the Argonaut Hotel property within 60 days and shortly thereafter start construction of its new edifice.

Eastman May Not Use Unexpended Funds

(*Continued from page 149*)

to important reports which had for a long period of time been in process of preparation and which, on June 16, were at the very stage of completion and final publication.

"I would appreciate your advice with reference to this matter as soon as possible, as early action is desirable in order to prevent the complete disintegration of my staff, and because action is necessary for the proper protection and preservation of the valuable records and other property which are in the branch offices occupying space not now under lease."

Ruling of Acting Comptroller General

The acting comptroller general ruled, however, that: "To the extent that orders were placed with the Public Printer before the expiration of Title 1 of the act the fund may be held to have been obligated thereby, but it cannot be held that the unexpended balance in this fund in excess of that obligated to the Public Printer or otherwise by proper action prior to June 17, 1936, has been or may be obligated for payment for such reports as are not yet in the hands of the printer or for any other expenses of the Office of the Co-ordinator of Traffic on and after June 17, 1936. The statute directs the disposition of the unexpended funds so collected and this office is without authority of law to waive the statutory requirement or to authorize any other disposition of the funds. It is to be regretted that proper steps were not taken, in anticipation of the expiration of your office, to make proper disposition of the records, furniture, etc., as there are now no funds available for the expenses incident to such disposition. The consent of all of the carriers to the continued use of the funds collected is ineffective to authorize the continuance of your office as a Federal agency."

Co-Ordinator Order Set Aside by I. C. C.

Because of the expiration of Title I of the emergency transportation act of 1933 on June 16, the Interstate Commerce Commission has issued an order vacating General Order No. 1 issued by the federal co-ordinator of transportation on July 17, 1933, requiring carriers to make monthly reports regarding employees who received pay during the month of May, 1933, and those who received pay during the month covered by the report. The commission said that as these statistics will serve no further useful service the carriers should be relieved of the burden and expense.

NEWS

Railroad Tour Included on World Power Conference Program

Final plans have been completed for a series of technical study tours to be conducted in conjunction with the Third World Power Conference which meets in Washington, D. C., September 7-12. Among these tours, which have been planned under the sponsorship of the engineering societies of the United States and the trade associations of industries concerned with power, is one on transport.

The railroad tour, the prospectus says, will emphasize "the important steps taken in recent months in the course of the vast modernization program undertaken by railroads in this country. Problems of electrification, Diesel engine drive, lightweight high speed trains, increased comfort on trains, etc., will be studied. Both the construction and installation of new equipment, and the operation of railroads will be treated." The technical tours will be held both before and after the conference sessions in Washington. The preconference railroad tour will cover New York, Schenectady, N. Y., Chicago and Pittsburgh, Pa., while the post-conference tour will cover these same cities, and in addition Niagara Falls, N. Y., and Philadelphia, Pa.

In addition to the railroad tour, four others are scheduled covering in turn mineral sources of energy, hydraulic sources of energy, metropolitan areas—utilities and research, and major construction projects. The sessions of the Washington meeting, the announcement says, will be specifically devoted to a study of "The National Power Economy," including a consideration of "all the broad economic issues involved in the production and use of power resources—coal, oil, gas, water power—from the standpoint of nearly 50 participating nations." The conference, it continues, will be conducted as an international forum, where "all sides of the questions growing up around public and private power policies can be presented."

Eastern Committee Appointed to Continue Co-ordination Studies

The Eastern Presidents' Conference at its July 16 meeting appointed a committee to take up the unfinished work of the Eastern Regional Co-ordinating Committee in connection with co-ordination projects concerning which no definite action had been taken at the expiration of Interstate Commerce Commissioner Eastman's term as federal co-ordinator of transportation. Members of the committee are M. W. Clement, president of the Pennsylvania; C. E. Denney, president of the Erie; H. S. Palmer, trustee of the New York, New Haven & Hartford; E. W. Scheer, president of the Reading-Central of New Jersey; and F. E. Williamson, president of the New York Central.

The appointment of this committee, the announcement says, is in accordance with a request of the Association of American Railroads, which asked Eastern, Western and Southern regional organizations to arrange for carrying forward studies which had been considered by the regional co-ordinating committees on behalf of the federal co-ordinator, as well as "such other projects as might from time to time be presented, having in view economies in operation through co-ordination of services of facilities."

The detailed studies in Eastern territory will be made by committees of operating officers representing New England and Trunk Line-Central Freight territories. Matters affecting roads in other territories will be handled in co-operation with similar committees in those sections.

Tyler Elected District Governor of Advertising Federation

Leslie H. Tyler, special representative of the New York, New Haven & Hartford, has been elected governor of the First (New England) District of the Advertising Federation of America. The district election at which Mr. Tyler was chosen was held in conjunction with the recent national convention of the Federation at Boston, Mass.

Have Your Baggage Checked

The habit, on the part of passengers, of taking an unnecessary amount of hand luggage with them into passenger cars, both coaches and parlor cars, as well as sleepers, which is now a familiar feature of passenger travel all over the country, has suggested to an officer of the Union Pacific —as appears in the Union Pacific Bulletin —that ticket sellers, as well as other employees coming in contact with passengers, might help to solve this problem by suggesting to people when they buy tickets that their hand baggage can be checked through to destination; or, in some cases, perhaps, to a station where a transfer is to be made.

Passengers may be reminded that with the general use of air-conditioned cars and other present-day improvements, the need of making a change of clothing while on the train will not be felt as in former times. And, as everyone must realize, the care of a number of pieces of baggage and the possible annoyance caused by excessive room occupied, are features of the journey which ought to be got rid of.

Rate Divisions Between Eastern and Southwestern Lines Prescribed

A readjustment of divisions of all all-rail joint class and commodity rates between points in Official Classification Territory and points in the Southwest, based on a mileage prorate with a 25 per cent inflation of the mileage in southwestern territory, intended to increase the revenues of the Southwestern lines, has been prescribed by the Interstate Commerce Commission to become effective on September 22 in a report and order finding the present divisions to be unjust, unreasonable, and inequitable. Commissioners Mahaffie, Lee, Splawn, and Caskie dissented.

The report was made in six cases which originated in complaints filed by the southwestern roads in 1932, with the eastern roads as defendants, the commission being called upon to determine not what each carrier in a through route shall receive, but to provide a basis for dividing every through rate into two parts, saying what proportion of the joint rate shall accrue to official territory carriers for their hauls to and from East St. Louis, Ill., and other gateways, and what shall remain for the southern, western, and southwestern carriers. Generally the new divisions are prescribed for the future but as to rates on fruits and vegetables and petroleum and its products the new basis is to be applied retroactively to the dates of the filing of complaints, cross-complaints, and petitions of intervention.

The specific finding is that just, reasonable, and equitable divisions to be received hereafter "should be based on a modified mileage prorate, using as factors for defendants the short-line distances between the Mississippi river, Ohio river, Maryland, Virginia, and interior Kentucky gateways through which the traffic moves and the points of origin and destination in eastern territory and for the complainants the short-line distances between the gateways and the points of origin and destination in southwestern territory, the distance factors for complainants to be increased 25 per cent, proportions to be subject to a minimum of 15 per cent of the joint rate." This finding is not to be understood as preventing the equalization of gateways or the use of group bases of divisions, employing existing groups or others similar thereto, the report says, but in arranging groups the percentages should reflect weighted average hauls within each group.

Commissioner Meyer, who wrote the majority report, said the record, "though not sufficiently complete and definite to make it ideal, is about all that can reason-

ably be expected, and, unquestionably, it affords a basis for action. It contains that 'substantial evidence' which the Supreme Court says is necessary to sustain an order. As in that case there is a 'mass of facts out of which experts could' reach a decision. Lawful divisions can be determined only by the consideration of all the facts and circumstances. The parties spent several years in making studies, gathering facts, and presenting these cases, and appear to have put forth their best efforts. Nevertheless, the record contains no one fact nor any particular group of facts leading to a specific conclusion with mathematical certainty or exactness. All we can do is to exercise our best judgment on the basis of all the facts before us."

Commissioners Mahaffie, Lee, and Splawn in their dissenting opinions objected because the majority decision leaves the southwestern lines to bear the expense of the bridge transfer at the St. Louis-East St. Louis gateway, which Commissioner Lee said in effect reduces the revenue received by the southwestern carriers approximately 6.5 per cent. Chairman Mahaffie said that if the cost of the river transfer were divided equally the basis of dividing the remainder prescribed by the majority would be equitable. He also objected to the retroactive application. Commissioner Lee said the eastern lines should be required to bear their share of the river transfer and that the distance factor of the southwestern lines should be inflated 30 per cent. Commissioner Splawn wrote a long opinion advocating more favorable treatment of the southwestern lines and questioning the conclusion of the majority that the cost of freight operation in the Southwest is only 10 per cent greater than in the East.

The railroads had asked for a rate prorate basis, the southwestern lines contending for a fifth-class prorate and the official territory carriers for a modified first-class prorate. Commissioner Caskie said he would have approved a prorate on the basis of first-class rates prescribed by the commission and that under the basis prescribed the official territory carriers will receive divisions in excess of their local rates.

Since July 14, 1928, the effective date of the commission's general revision of southwestern rates, the report says, there has generally been no mutually accepted basis of division of the prescribed rates. "As a result, the delivering carriers in each group, whose duty it generally is to collect the freight charges, have, on each shipment, been taking what they wanted, or thought proper, out of the joint rates and have remitted the balance to the carriers on the other side of the gateways. The southwestern group, in dividing the prescribed westbound rates, have been using practically a revenue prorate, based on the rates and divisions in effect prior to the southwestern revision. The eastern group have been generally taking their locals, and in some instances on petroleum and its products, amounts much in excess of their locals, except to destinations in Indiana."

No estimate is given as to the amount of the increases which the Southwestern lines are expected to receive, but the report says that "indications given by traffic tests are that under the present disorderly method of dividing the rates the revenue of the Southwestern carriers is in the aggregate less than it would be under a mileage prorate with their distances constructively inflated 10 per cent."

C. E. Wright Becomes Managing Editor of Iron Age

Clarence E. Wright has been appointed managing editor of the Iron Age. Thus he returns to the publication with which he was associated prior to 1933 as market and news editor. For three years Mr. Wright has been with the Republic Steel Corporation.

Surcharges in North Carolina

On petition of the railroads the Interstate Commerce Commission has ordered an investigation of the failure of the North Carolina Utilities Commission to authorize for intrastate traffic the temporary continuance of the emergency freight charges authorized by the federal commission in Ex Parte No. 115.

Westinghouse Golden Jubilee Day at Cleveland Exposition

Saturday, July 25, has been designated as "Westinghouse Golden Jubilee Day" at the Great Lakes Exposition now being held in Cleveland, Ohio. Special ceremonies will be provided in commemoration of the fiftieth anniversary of the Westinghouse Electric & Manufacturing Company, with the management of the latter co-operating with the exposition directors in staging appropriate events for the day.

Water Main Breaks in Union Station, Chicago

Damage estimated at approximately $200,000 resulted on July 21 when a 36-in. water main under Canal and Harrison streets burst and flooded the train shed and basement of the Union Station and the basement of the post office at Chicago. Train service was disrupted during the forenoon. Water in the basement stopped the power plant and the building was without lights and elevator service.

Baltimore & Ohio Trains Faster

The Baltimore & Ohio announces that the National Limited (train No. 1), leaving Jersey City at 1:42 p. m. daily, is to be run through to St. Louis, beginning July 26, in 1 hr. 23 min. less time than at present, with corresponding shortening of time to Cincinnati, Ohio, and Louisville, Ky. According to schedules in the Official Guide, this makes the new time through 25 hr. 10 min.

Also, the Diplomat (train No. 3), leaving Jersey City at 6 p. m., will have its time reduced 2 hr. 30 min., with corresponding reductions to Cincinnati and Louisville. This makes the new time through 26 hr. 15 min.

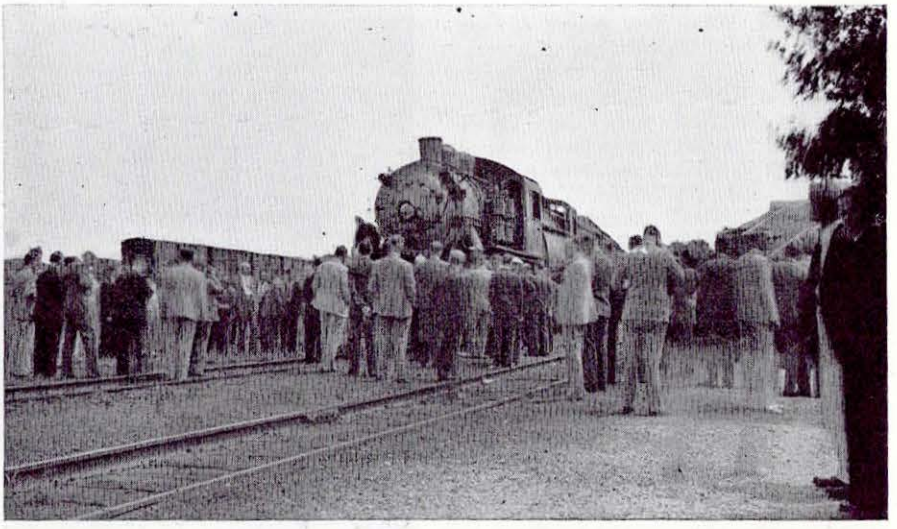
Historical Society Trip Marks Morris & Essex Centennial

A camel-back ten-wheeler built in 1910 returned temporarily to main line service on the Delaware, Lackawanna & Western on Sunday, July 19, when it drew a special train containing a party organized by the New York Chapter of the Railway and Locomotive Historical Society from Hoboken, N. J., to Scranton, Pa. The trip marked the centennial of the Morris & Essex, now the route of the Lackawanna across New Jersey.

The locomotive was resplendent with new paint and burnished fittings and it further belied its age by pulling the train up a slight grade of 28 mi. in 26 min., according to the timing of the historians. The combination baggage car used was about the same age as the locomotive but the following dining car and three coaches were the latest air-conditioned types on the Lackawanna.

Employees along the line watched the progress of the train with interest, while some twenty persons with cameras aimed at the train were counted along the right of way between Hoboken and Dover, N. J. The locomotive was equipped with the Wooten wide firebox designed for anthracite and had separate cabs for the engineman and fireman. It was built as the Schenectady works of the American Locomotive Company.

Non-railroaders to the number of 137



Members of the Railway & Locomotive Historical Society Inspecting the Lackawanna's Old Camel-Back, No. 1035

were in the party, augmented by about 16 excursionists from roads other than the Lackawanna, and a group of Lackawanna men which included a half-dozen retired enginemen. The latter expressed satisfaction at the performance of No. 1035. The party made an extensive inspection of the Lackawanna's shops at Scranton, some twenty Lackawanna officers acting as guides.

Railway Purchases in Western States

The Western Railways' Committee on Public Relations has compiled information obtained from the Class I railroads in the West showing the number of men employed, the wages paid and the purchases of equipment, material and supplies made in each of the western states during 1935 by the Class I railroads operating in those states. The purchases were compiled to show as nearly as practicable the expenditures in the states from which the materials were shipped to the railroads, and are given in the table.

Railway Employees, Payrolls and Purchases by States

Class I Railways, Calendar Year 1935

State	Per cent completeness*	Employees	Wages	Purchases
Arizona	100	4,319	$7,924,946	$271,796
Arkansas	85	9,285	13,169,390	4,107,126
California	100	39,239	67,128,549	27,589,702
Colorado	100	11,772	19,667,283	10,867,523
Idaho	100	4,923	8,021,525	336,754
Illinois	91	78,287	130,299,572	74,125,918
Iowa	100	24,685	39,074,578	3,648,199
Kansas	100	25,722	40,191,371	6,602,059
Louisiana	98	10,946	14,968,720	5,182,591
Minnesota	100	29,303	48,717,310	14,835,898
Missouri	97	30,649	50,620,872	17,166,585
Montana	100	8,375	14,923,234	3,834,399
Nebraska	100	16,040	27,419,555	2,949,740
Nevada	100	3,158	5,274,841	44,146
New Mexico	100	5,000	7,652,054	2,287,641
North Dakota	100	5,586	8,869,138	116,606
Oklahoma	100	9,920	15,235,086	6,182,706
Oregon	100	7,597	12,724,588	4,205,682
South Dakota	100	4,013	6,206,485	224,667
Texas	96	39,605	61,858,244	19,232,287
Utah	100	6,357	10,768,930	2,821,349
Washington	100	12,565	22,469,225	8,339,792
Wisconsin	100	22,247	34,531,826	7,342,866
Wyoming	100	6,310	10,567,569	9,884,864

* Represents percentage of total mileage operated by Class I railways in each state which is covered by the figures in subsequent columns. For example, the figures for Arizona include all Class I railways operating in that state: the figures for Arkansas include Class I railways operating 85 per cent of the total Class I operated mileage in that state, etc.

New Haven Booklet on Business Travel by Rail

The New York, New Haven & Hartford has issued an attractive illustrated booklet (20 pages, 7 in. by 10 in., printed in color) designed to show business travelers how the "new travel values" created by the recent fare reductions may be adapted to individual requirements. The booklet, entitled "More for Your Money in Business Travel," compares the cost in money and time of rail and automobile travel and offers to business houses the advice of the road's recently-established Travel Analysis Service.

The latter, staffed by trained specialists, is designed to offer recommendations regarding possible travel economies from improved routings whereby better coverage and lower sales costs can be secured. The section on "Travel by Automobile vs. Rail" sets up a table of comparative costs which shows that for a 50-mi. journey the cost by automobile would be $1.85 as compared with $1 by rail; and for a 200-mi. trip the respective figures would be $7.40 and $4. These rail figures are based on the two-cent coach rate, while the automobile costs are set up at 3.7 cents per mile, a figure based on actual company-surveys and independent investigation among representative firms.

Other sections deal with time and money savings for the "middle-distance" (up to 150 mi.) traveler, opportunities for coordination of rail and highway travel, and time costs as a travel factor. The latter includes a table which shows that when the traveler's salary is $50 a week, or $1.25 an hour, the cost of travel time (3 hr. 20 min.) for a 100-mi. journey by highway would be $4.17, whereas the same journey could be made by rail in 2 hr. 25 min. at a salary cost of $2.75. At $150 a week salary, the figures are: Highway, $12.51; rail, $8.25.

Other advantages of rail travel are also cited, including the convenience of rail scrip, issued by the New Haven and acceptable for both rail and Pullman fares, and in dining cars. Finally, the safety, speed, comfort, convenience, dependability and economy of rail travel are stressed. The booklet also includes several attractively-done illustrations of New Haven equipment, as well as tables of fares for convenient reference.

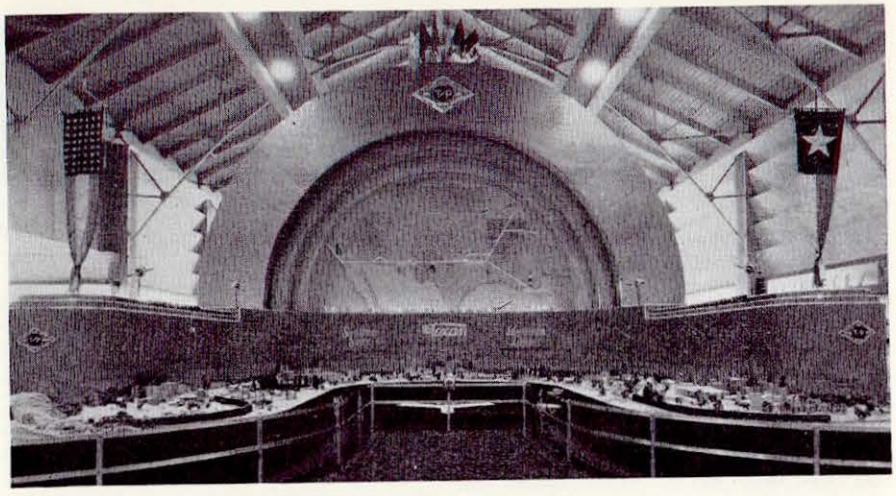
I. C. Hospital Department 25 Years Old

This month marks the twenty-fifth anniversary of the hospital department of the Illinois Central. Starting with a small hospital inherited from a subsidiary line, this department now operates modern hospitals in Chicago, Paducah, Ky., and New Orleans, La., valued at $1,500,000 and having an aggregate capacity of approximately 500 beds. In addition to these hospitals, the Illinois Central has 127 designated hospitals for emergency cases, 458 designated druggists and a staff of 754 surgeons. It treated 3,786 employee cases in its hospitals in 1935, involving a total of 51,194 hospital days, and examined and treated 165,520 employee cases in 1935 outside of the hospitals. It is calculated that the hospital department has lengthened the average working life of employees by about eight years.

Southern Pacific and Texas & Pacific Exhibits at Texas Centennial

The Southern Pacific exhibit at the Texas Centennial, as described in the *Railway Age* of June 27, is of Spanish architecture. Murals showing scenes from Texas and the Southwest are displayed on the outside, together with drumheads from various trains. On the interior walls are

Southern Pacific Display at Dallas Centennial



The Texas & Pacific Exhibit

fine transparencies and a talking map, shown in the background through the doorway. The routes of the Southern Pacific are shown over the group of pictures by using lighted buttons of different colors. Legends and unusual facts developed from the covering of the route are given with a phonographic record and a loud speaker hookup.

The Texas & Pacific is using a model train system to show the area served by its passenger and freight trains. A water scene of the harbor district of New Orleans is incorporated in the exhibit, showing in models steamers plying up the river, landing at docks and unloading. Also shown is the oil field sector served by the T. & P. with tiny oil wells and rigs, trucks and houses.

Reduced Rates on Cotton From Texas Authorized

A proposed reduction in the rates on cotton, in carloads, from points in interior Texas over routes embracing system lines of the Texas & Pacific and the Louisiana & Arkansas, to New Orleans, La., for export or coastwise movement beyond, has been found justified by the Interstate Commerce Commission in a report accompanied by an order vacating its suspension order of last August. The schedules had been filed to become effective on September 1, 1935, for the purpose of equalizing the rates to New Orleans with similar rates from the same points to the ports of Houston, Galveston, and Texas City, Tex. The Texas port carriers had protested, contending that the arrangement would have a harmful effect upon the southwestern carriers as a whole but the commission found that the proposed rates would yield some profit and therefore exceeded the minimum of reasonableness.

Eastern Roads Show Reduced Gain in Passenger Revenue in June

Thirty-six out of 53 Class I railroads in the eastern district in June, the first month of the new reduced passenger fares, showed an increase of 4.9 per cent in passenger revenues as compared with the figures for June, 1935, according to estimates received by the Interstate Commerce Commission's Bureau of Statistics up to July 16. An earlier compilation made public by the commission had shown an increase of 5.9 per cent for 27 eastern roads. The same roads had submitted an estimated increase of 13.1 per cent in freight revenues. Three of the four roads in the Pocahontas region showed an increase of 13.2 per cent in passenger revenues, 21 of 28 southern roads showed an increase of 13.8 per cent, and 42 of 59 western roads showed an increase of 20.5 per cent. For the five months ended with May 31, before the fare reduction, the eastern roads had shown an increase of nearly 10 per cent in passenger revenues, while the railroads of the United States as a whole showed an increase of 13 per cent.

Increase in Long Island Commutation Rates Disapproved

The two commissions of New York State, one having jurisdiction within New York City and the other in the rest of the state, have joined in refusing to approve increases in commutation fares to and from New York City, proposed by the Long Island, in August, 1935; 15 per cent on journeys within New York City, and 20 per cent on those extending beyond the city limits. A large number of public hearings have been held. The commissions hold that the railroad has not proved a need of increased income on the suburban traffic. This traffic, because of the depression, has fallen off only 21 per cent, while other passenger traffic has fallen off 49.5 per cent, and freight traffic, 48.7 per cent. The decision says that data presented by the road concerning the volume and earnings of commutation traffic are based so much on estimates as to be unacceptable.

The company is reminded that other railroads have recently endeavored to increase income by improving the service, while the Long Island does not take action in that direction. The Pennsylvania, owner of the Long Island, is charged with collecting excessive rents from the Long Island for use of the Pennsylvania Station in New York City. The commissioners also reject the argument that the recent reduction in non-commutation fares by the Interstate Commerce Commission will not increase the company's net income.

Chairman Maltbie, of the Public Service Commission, in a supplementary opinion, philosophizes on the tendency of monopolies to become lethargic; to oppose experiments and to let well enough alone. The Long Island, years ago, voluntarily made commutation rates on a basis calculated to produce low profits, this to increase the population of the suburban towns; and there is no justification, says the chairman, for seeking larger profits now. By its course, he adds, the road has lost the confidence of the public.

Construction

DELAWARE, LACKAWANNA & WESTERN.—Five crossings of this road in Avoca, N. Y., have been added to the list of crossings to be considered for elimination by the New York Public Service Commission during 1936. The estimated cost is $200,000, of which half would be paid by the railroad company, one percent by the county and the remaining part by the state. The railroad company believes these crossings should be eliminated and it is prepared to proceed with the work immediately.

MINNEAPOLIS & ST. LOUIS.—A contract has been awarded to the Ross & White Company, Chicago, for the installation of an automatic, electric, engine coaler at Morning Sun, Iowa.

NORTHERN PACIFIC.—Bids are now being received by this company for the construction of enginehouse extensions at Livingston, Mont., and Missoula. At Missoula the present enginehouse will be enlarged to provide seven stalls, 145 ft. deep, to house new freight power now being built for this company by the American Locomotive Company. This project will cost approximately $50,000. At Livingston it is proposed to extend six stalls of the present house at a cost of $25,000. Bids for these projects are returnable on July 27.

UNION PACIFIC.—A contract has been awarded to Ryberg Brothers, Salt Lake City, Utah, for the reconstruction of this company's dining, recreation and lounging lodge on the north rim of the Grand Canyon at Grand Canyon, Ariz., which was destroyed by fire in 1932. The new lodge, which will cost approximately $250,000, will be similar to its predecessor. It will have overall dimensions of 220 ft. by 240 ft., and will be constructed of native stone and logs. It will include a large dining salon, an outdoor dining terrace overlooking the canyon, a recreation and entertainment hall, a grand observation terrace with an out-of-doors fireplace, a lounge for smoking and bridge incorporating a large fireplace, and a main lobby. The building will be U-shaped, one wing being used for the curio store and tea room and other facilities for guests, while the other will embrace the kitchen, refrigerator room, bakery, etc.

WABASH.—In connection with the construction of a new bridge across the Missouri river at St. Charles, Mo., this company plans to construct at that point, with

its own forces, a one-story brick passenger station, 23 ft. by 64 ft., and to erect a water tank, water columns and appurtenances. This project, which will cost about $35,000, is being financed by PWA loans.

WABASH.—United States District Judge Charles B. Davis has authorized this company to make the following improvements costing a total of $43,978: Enlargement of the steam plant in the enginehouse at Decatur, Ill., so that the capacity will be sufficient to supply heat for this company's passenger station at that point; strengthening the ship dock walls at Seventeenth street in Detroit, Mich.; and constructing an office, blacksmith shop and storeroom at Brooklyn, Ill., to replace a building that was destroyed by fire on February 28, 1936.

Equipment and Supplies

LOCOMOTIVES

THE PITTSBURGH & WEST VIRGINIA has ordered two 2-6-6-4 type single-expansion articulated locomotives for heavy freight service in the Pittsburgh district, from the Baldwin Locomotive Works.

THE RICHMOND, FREDERICKSBURG & POTOMAC, reported in the *Railway Age* of July 4 as inquiring for five locomotives of the 4-8-4 type, has ordered this equipment from the Baldwin Locomotive Works. The locomotives will be equipped with 12-wheel tenders and will be used in passenger service.

FREIGHT CARS

THE WABASH is inquiring for 400 hopper cars of 55 tons' capacity.

WILSON & COMPANY, Chicago, are inquiring for seven special tank cars of 7,000 gal. capacity.

THE MINNEAPOLIS & ST. LOUIS has ordered 60 hopper cars from the General American Transportation Corporation.

THE NEWFOUNDLAND RAILWAY has ordered 50 steel underframe, 42-in. gage box cars of 30 tons' capacity, from the Koppel Industrial Car & Equipment Company.

THE NORFOLK & WESTERN has placed orders for 1000 steel box cars, divided as follows: 800 standard 40-ft. cars to the Ralston Steel Car Company, 100 automobile cars with loading devices to the Magor Car Corporation, and 100 cars, 50-ft. length, to the Greenville Steel Car Company.

IRON & STEEL

THE ST. LOUIS SOUTHWESTERN has ordered 3,500 tons of rails from the Carnegie-Illinois Steel Company, and 1,000 tons from the Bethlehem Steel Company.

Supply Trade

George B. Allison, district sales manager of the **Excel Curtain Company,** New York, has been transferred to the home office and plant at Elkhart, Ind.

F. H. Hardin, assistant to the president of the New York Central, has resigned to accept the position of president of the **Association of Manufacturers of Chilled Car Wheels** on September 1. He will succeed J. A. Kilpatrick, who will devote his time to private interests.

Paul C. Cady, formerly of the engineering department of the New York Central, has been elected vice-president in charge of sales for the Eastern district for the **Union Railway Equipment Company,** Chicago, with headquarters at 30 Church Street, New York, and **B. C. Tucker,** formerly of the Midland Railway Supply Company, has been appointed sales representative in charge of special work, with headquarters in the Midland Building, Cleveland, Ohio.

OBITUARY

R. I. Baird, of the Railway division, Chicago branch of The Electric Storage Battery Company, died suddenly on July 4 at the age of 54 years. Mr. Baird was born at Jacksonville, Fla., and was graduated from Armour Institute of Technology. Prior to his connection with The Electric Storage Battery Company he was employed in the signal department of the

R. I. Baird

Illinois Central. He had been in the employ of The Electric Storage Battery Company at Chicago since 1909, with the exception of a period of four years during which he operated a ranch in Montana. Mr. Baird was senior vice-president of the Railway Electric Supply Manufacturers' Association. He was also an active member of the Pioneers' Club, an organization of railway electrical men who have been following their professions 20 or more years.

Financial

CHESAPEAKE & OHIO.—*Notes.*—The Interstate Commerce Commission has authorized this company to issue $15,300,000 of serial notes, issue of 1936, bearing interest depending upon maturity, varying from 5/8 per cent to 2 7/8 per cent (maturities to be in 10 equal annual series beginning 1937). The issue has been sold at 99 to Morgan, Stanley & Co., and the proceeds used to retire 4 per cent equipment trust certificates, effecting a total saving in interest of $1,670,825.

CHICAGO & NORTH WESTERN.—*Reorganization.*—The Interstate Commerce Commission has assigned the reorganization plan recently filed by the company for hearing at Washington on September 9 before Examiners Boyden and Walsh.

CHICAGO GREAT WESTERN.—*R. F. C. Equipment Loan.*—The Interstate Commerce Commission has authorized this company to sell at par $150,000 of 4 per cent equipment trust certificates to the Reconstruction Finance Corporation. This issue will mature serially from 1937 to 1935 and represents approximately 75 per cent of the cost of 100 flat cars which are the security upon which the issue is based.

DENVER & RIO GRANDE WESTERN.—*Reorganization Plan.*—A plan for reorganization of the Denver & Rio Grande Western, providing for the consolidation of all its subsidiary properties, was to be filed with the federal district court and the Interstate Commerce Commission on July 25. The plan is essentially that approved by the board of directors of the road in New York on July 9, and is the result of lengthy negotiations between officers of the road and representatives of security holders.

DENVER & SALT LAKE WESTERN.—*Compensation of Trustee and Counsel.*—The Interstate Commerce Commission has authorized annual compensation of $6,000 each for R. L. Sauter, trustee, and E. R. Myer, counsel to trustee, of this company.

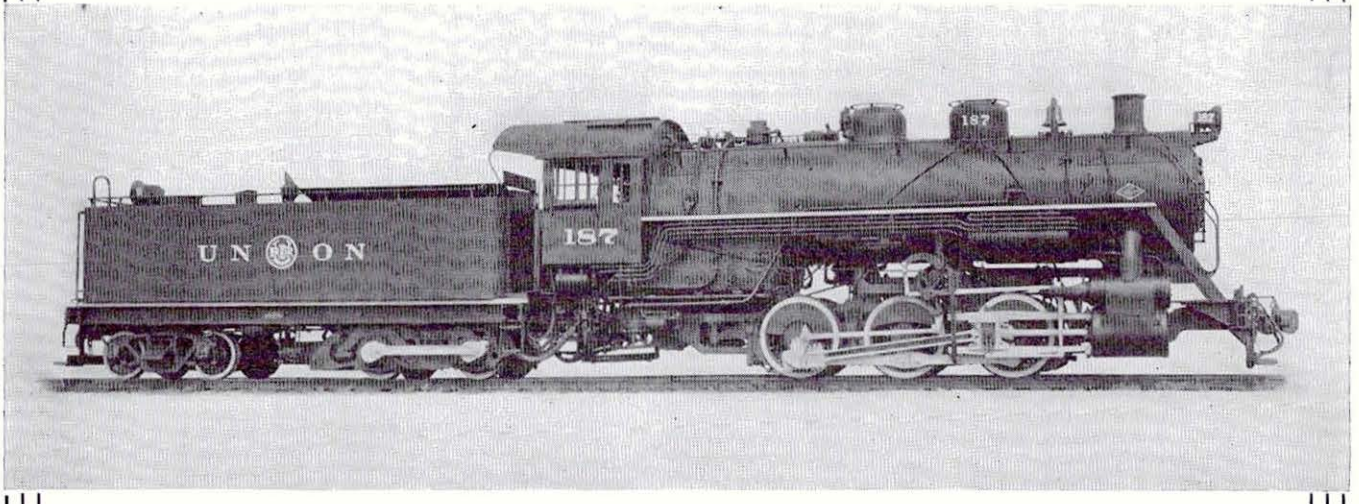
LOUISVILLE & NASHVILLE.—*Dividend.*—Directors have declared a dividend of $2.50 on the common stock, payable August 24 to holders of record on June 28. This represents an increase of 50 cents over the last disbursement—$2—made February last.

MILWAUKEE, ROCKFORD & SOUTHWESTERN.—*R. F. C. Loan Denied.*—The Interstate Commerce Commission has denied the application of this company for authority to borrow $90,000 from the Reconstruction Finance Corporation to finance the purchase of new equipment.

MINNEAPOLIS & ST. LOUIS.—*Dismemberment Hearings.*—Hearings before the Interstate Commerce Commission on the proposal of Associated Railways, Inc., to abandon certain portions of the M. & S. L. continued throughout the last week at points in Iowa, Minnesota and South Dakota. Testimony was given by representatives of business and communities, describing the effect the abandonment would

Continued on next left-hand page

MODERN
Switching Power
FOR THE UNION RAILROAD



Five 6-wheel switching locomotives were recently completed by Lima Locomotive Works for the Union Railroad Company.

These locomotives are equipped with rolled slab steel frames and represent the latest design in modern switching power.

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

LIMA
LOCOMOTIVE WORKS
INCORPORATED

have on business and employment in the towns left without railway service. At a one-day hearing at Spencer, Iowa, on July 13, and a two-day hearing at St. James, Minn., on July 14 and 15, testimony was heard on the proposed abandonment of that portion of the line from Winthrop, Minn., to Spencer, Iowa. On July 16 to 21 hearings were confined to testimony on the abandonment of 176 miles of the 269 miles in South Dakota. Three days' testimony was taken at Aberdeen, S. D., on July 16 to 18, one day at Selby, on July 20, and one day at Watertown, on July 21. Rebuttal testimony will be heard at Minneapolis, Minn.

MISSOURI PACIFIC.—*Absolved from Terminal Debt.*—The federal district court in St. Louis on July 22 freed this company from a debt of $19,000,000 to Terminal Shares, Inc., representing the unpaid balance on contracts for the purchase of terminal properties at Kansas City and St. Joseph, Mo., which contracts had previously been held "improvident, unfair, unlawful and overreaching" by the circuit court of appeals. The trustee for the company is suing the vendor to recover $3,200,000 already paid under the contracts.

NORFOLK & WESTERN.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to acquire the physical properties of the following subsidiaries: Tug River & Kentucky, Williamson & Pond Creek, Buck Creek R.R. and Knox Creek Ry.—totaling 26.7 miles of main line and 30.7 miles of sidings.

SOUTHERN PACIFIC.—*Truck Line Acquisition.*—The Pacific Motor Trucking Company, a subsidiary of the Southern Pacific, has applied to the Interstate Commerce Commission for authority to purchase the property of the Salinas-King City Freight Lines for $2,300.

WHEELING & LAKE ERIE.—*Equipment Trust Certificates.*—The Interstate Commerce Commission has authorized this company to assume liability for $1,400,000 of 2¼ per cent equipment trust certificates, series D, secured by hopper cars costing $1,929,500 and maturing 1937-49, and to sell the issue to the Union Trust Company (Pittsburgh) at 101.09, making the average interest cost 2.04 per cent.

Average Prices of Stocks and of Bonds

	July 21	Last week	Last year
Average price of 20 representative railway stocks..	53.98	53.74	35.25
Average price of 20 representative railway bonds..	80.73	80.51	74.40

Dividends Declared

Chestnut Hill.—75c, quarterly, payable September 4 to holders of record August 20.

Delaware & Bound Brook.—$2.00, quarterly, payable August 20 to holders of record August 18.

Erie & Kalamazoo.—$2.50, payable August 1 to holders of record July 25.

Louisiana & Missouri.—Preferred, $3.50, semi-annually, payable August 1 to holders of record July 20.

Louisville & Nashville.—2½ per cent, payable August 24 to holders of record July 28.

Mine Hill & Schuylkill Haven.—$1.25, semi-annually, payable August 1 to holders of record July 15.

North Carolina.—7 Per Cent Guaranteed, $3.50, semi-annually, payable August 1 to holders of record July 20.

Oswego & Syracuse.—$2.25, semi-annually, payable August 20 to holders of record August 7.

Piedmont & Northern.—75c, payable July 10 to holders of record June 30.

Railway Officers

EXECUTIVE

F. H. Hardin, assistant to the president of the New York Central, has resigned to accept the position of president of the Association of Manufacturers of Chilled Car Wheels on September 1.

Willis E. Maxson, assistant general manager of the Gulf, Colorado & Santa Fe (part of the Santa Fe System), who has been appointed vice-president and general manager of the G. C. & S. F., with headquarters as before at Galveston, Tex., has been connected with the Santa Fe for about 50 years. A native of Mapleton, Kan., Mr. Maxson received his higher education at Baker university, Baldwin, Kan. He entered railway service in February, 1885, with the Santa Fe, serving as a clerk and telegraph operator at Girard, Kan., in various positions in the engineering department on construction work, and as a relief agent on the Southern division until 1889. In 1891 he was appointed joint agent at Purcell, Okla., for the A. T. & S. F. and the G. C. & S. F., and from 1897 to 1901 he served as agent and superintendent of terminals of the G. C. & S. F. at Galveston, then being appointed superintendent of the Beaumont division at Beaumont, Tex. In August, 1906, Mr. Maxson was advanced to general superintendent at Galveston and from July, 1918, to March, 1920, during federal control of the railroads, he served as general manager of a group of lines in the Southwest, including the G. C. & S. F., the St. Louis, San Francisco & Texas, part of the International-Great Northern and a portion of the A. T. & S. F. At the end of this period he was appointed assistant general manager of the G. C. & S. F. at Galveston, which position he held until his recent appointment as vice-president and general manager, effective July 1.

Frank G. Pettibone, vice-president and general manager of the Gulf, Colorado & Santa Fe (part of the Santa Fe System), with headquarters at Galveston, Tex., who has retired, as reported in the *Railway Age* of July 4, was born on September 27, 1861, at Rockford, Ill. Mr. Pettibone first entered railway service in 1875, with the Chicago, Burlington & Quincy, serving successively as a messenger boy, operator, clerk and chief clerk to the superintendent at Burlington, Iowa, until 1884. In 1885, Mr. Pettibone went with the St. Paul, Minneapolis & Manitoba (part of the Great Northern) as chief clerk to the assistant general superintendent at St. Paul, Minn. In the following year he became connected with the Northern Pacific and served as chief clerk to superintendent and to general superintendent until 1901, when he entered the service of the G. C. & S. F., as assistant to the general manager. Two years later he was advanced to general superintendent on this road and in 1906 he was further promoted to vice-president and general manager, which position he held until his retirement, effective July 1. At the time of his retirement Mr. Pettibone was also president of the Houston Belt & Terminal.

Frank G. Pettibone

FINANCIAL, LEGAL AND ACCOUNTING

Robert S. Gawthrop, solicitor for the Pennsylvania, has been appointed general attorney, with headquarters at Philadelphia, Pa. **W. W. Wells,** manager of the president's office, has been appointed assistant secretary, with headquarters at Philadelphia, Pa.

OPERATING

L. G. Ellis, chief clerk to the superintendent of the Columbus & Greenville, has been appointed superintendent of car service, with headquarters at Columbus, Miss., to succeed **W. G. Johnston,** whose death was noted in the *Railway Age* of July 11.

M. A. Eddy has been appointed trainmaster of the Third and Fourth districts of the Kansas City Southern and the Arkansas Western, with headquarters at Heavener, Okla., to replace **D. B. James,** who has been transferred to the First and Second districts, with headquarters at Pittsburg, Kan., to succeed **F. H. Hooper,** transferred.

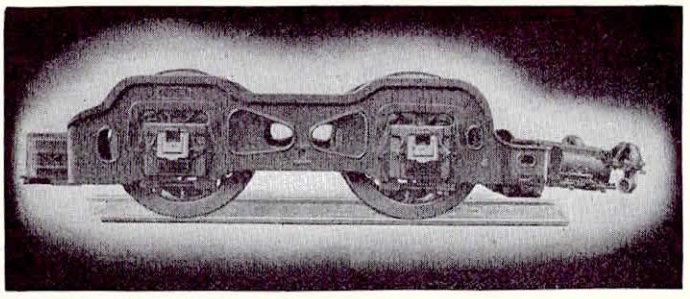
Don S. Colby, assistant superintendent of the Idaho division of the Northern Pacific, with headquarters at Pasco, Wash., has been promoted to superintendent of the Fargo division, with headquarters at Fargo, N. D., succeeding **Fred Brastrup,** who has been transferred to the Idaho division at Spokane, Wash., to replace the late **J. H. Johnson.** Both appointments became effective on July 16.

J. Davis, district engineer of the Southern district of the Missouri Pacific, with headquarters at Little Rock, Ark., has been appointed superintendent of the Arkansas division, with headquarters at Little Rock, Ark., to succeed **H. E. Roll,** who has been appointed director of terminals and freight train classification, with headquarters at St. Louis, Mo. **C. W. Exline** has been appointed assistant superintendent of the Memphis division, with headquarters at Wynne, Ark., to succeed

Continued on next left-hand page

TO MAINTAIN OPERATING STANDARDS WITH AIR CONDITIONED TRAINS . . .

DEMANDS BOOSTER POWER



The necessity of air conditioning through passenger trains adds equivalent weight of one or more cars.

If operating standards are to be maintained this increased load can best be compensated for by the application of The Locomotive Booster.

The Locomotive Booster provides the added power needed for smooth starting and quick acceleration to road speeds. With fast schedules these minutes gained at every stop are a material factor in keeping trains on time.

Whatever the additional demands on the locomotive, The Booster provides the most economical means of maintaining satisfactory train operation and railroad popularity.

No locomotive device is better than the replacement part used for maintenance.
Genuine Franklin repair parts assure accuracy of fit and reliability of performance.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

H. A. Israel, who has been appointed trainmaster on the Illinois division and of the Missouri-Illinois Railroad east of the Mississippi river, with headquarters at Bush, Ill., succeeding **W. A. Learmont.** Mr. Learmont has been transferred to the Central Kansas-Colorado divisions, with headquarters at Hoisington, Kan., to replace **R. E. Allen,** who has been transferred to the Colorado division at Pueblo, Colo., to succeed **E. K. Lucy. R. L. Hardgrave** has been appointed acting trainmaster on the Memphis division, with headquarters at Wynne, Ark., to succeed **T. R. Nash,** who has been granted a leave of absence.

J. R. Skillen, trainmaster on the Atchison, Topeka & Santa Fe at Dodge City, Kan., has been appointed superintendent on the Panhandle & Santa Fe (part of the Santa Fe System), with headquarters at Slaton, Tex., to succeed **G. C. Jefferis,** who has been transferred to the Oklahoma division of the Santa Fe, with headquarters at Arkansas City, Kan. Mr. Jefferis succeeds **W. C. Baisinger,** who has been transferred to the Western division, with headquarters at Dodge City, where he succeeds **O. J. Ogg,** who has retired.

Charles L. Ruppert, who retired on July 1 as superintendent of the Illinois division of the Chicago, Rock Island & Pacific as noted in the *Railway Age* of July 11, was born on October 7, 1867, at Dusseldorf, Germany. He first entered railway service on July 2, 1887, with a predecessor line of the Pere Marquette, serving as a telegraph operator, agent, car distributor and train dispatcher. On July 2, 1902, Mr. Ruppert went with the Chicago & Alton (now the Alton) as a dispatcher at Springfield, Ill., remaining with this company until January 3, 1903, when he accepted a position with the Atchison, Topeka & Santa Fe at Dodge City, Kan., later serving as chief train dispatcher and trainmaster with this company. On May 1, 1905, Mr. Ruppert became connected with the Rock Island as a trainmaster at Trenton, Mo., being promoted to superintendent at Amarillo, Tex., on February 1, 1911. He served successively in this position at Fort Worth, Tex., El Reno, Okla., and Trenton until August 1, 1918, when he was appointed superintendent of the Illinois division at Rock Island, Ill., the position he was holding at the time of his recent retirement.

Fred E. Sperry, who has been appointed assistant to the general manager of the Chicago, Burlington & Quincy, Lines East of the Missouri river, as announced in the *Railway Age* of July 11, was born on March 27, 1891, at Detroit, Mich. Mr. Sperry entered railway service with the Burlington on October 5, 1907, as a yard clerk at St. Paul, Minn. On February 21, 1909, he was appointed telegraph operator on the La Crosse division, and on August 6, 1912, he was made chief clerk to the assistant superintendent at St. Paul, Minn. On February 1, 1918, Mr. Sperry was appointed night yardmaster at La Crosse, Wis., and later in the same month he was transferred to Savanna, Ill. Two years later he was advanced to general yardmaster at the same point, and in 1925 he was transferred to St. Paul, Minn. After three years at the latter point Mr. Sperry was appointed trainmaster at Galesburg, Ill., and later in the same year he was made terminal trainmaster, with the same headquarters. At the time of his recent appointment as assistant to the general manager, with headquarters at Chicago, he was serving as acting superintendent of terminals at St. Louis, Mo.

William P. Wilson, who has been appointed superintendent of terminals of the Chicago, Burlington & Quincy at St. Louis, Mo., as reported in the *Railway Age* of July 11, was born on November 30, 1894, at Robinson, Ill. He entered railway service in 1912 and served with various lines as a telegrapher until 1916, when he entered the service of the Colorado & Southern (part of the Burlington System) as a telegrapher at Loveland, Colo. On November 1, 1917, he was advanced to train dispatcher and on June 1, 1919, he was further promoted to chief dispatcher at Denver, Colo. On December 8, 1930, Mr. Wilson was appointed transportation assistant to the general manager of the Burlington at Omaha, Neb., then being advanced to trainmaster at Sterling, Colo., on October 1, 1931. Subsequently he was appointed assistant superintendent of the Sheridan division and on May 27, 1934, he was transferred to the McCook division, with headquarters at Denver. He was holding the latter position at the time of his recent appointment as superintendent of terminals at St. Louis, which was effective on July 6.

William P. Wilson

Chris McDonough, who has been appointed general manager of the Eastern lines of the Great Northern, with headquarters at Duluth, Minn., as announced in the *Railway Age* of July 4, has been in the service of this company for 44 years. He first served as a laborer at St. Paul, Minn., and after six years he obtained a position in the office of the division superintendent at Havre, Mont. His early experience was obtained mostly in Montana, although he served for brief periods at Superior, Wis., Portland, Ore., and St. Paul, Minn. He became superintendent of the Cascade division in 1918, holding this position until 1930, when he was made general superintendent at St. Paul. In 1931, when the latter position was abolished, Mr. McDonough returned to Spokane, Wash., as superintendent of the Cascade division, the position he was holding at the time of his recent appointment as general manager of the Eastern lines.

Chris McDonough

PURCHASES AND STORES

G. O. Beale, assistant to the vice-president of the Chesapeake & Ohio, the New York, Chicago & St. Louis and the Pere Marquette, with headquarters at Cleveland, Ohio, has been appointed chief purchasing and stores officer of these roads, in which position he succeeds to a portion of the duties of **W. G. Black,** vice-president in charge of purchasing, stores and mechanical matters of these three lines, who died on June 20.

TRAFFIC

H. C. Mitchell, general freight agent of the Virginian, with headquarters at Norfolk, Va., has been appointed assistant traffic manager, with the same headquarters. **J. S. Branch,** commercial agent, has been appointed general freight agent-solicitation, with headquarters as before at Norfolk, Va., succeeding Mr. Mitchell. These appointments will become effective August 1.

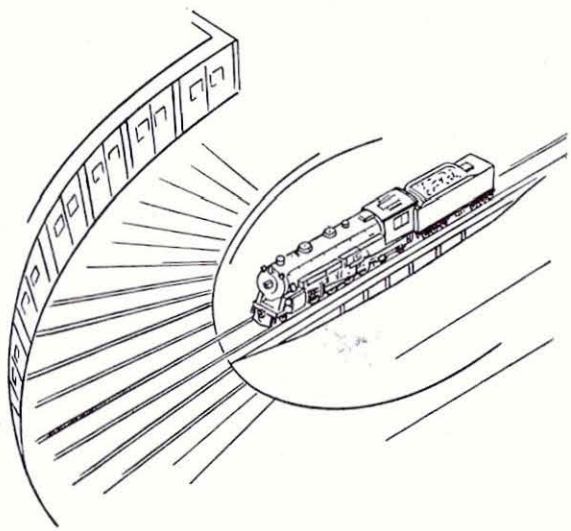
P. W. Johnston, general agent, passenger department, of the Chicago, Rock Island & Pacific at New York, has been appointed general passenger agent at Kansas City, Mo., to succeed **C. A. Searle,** who has retired. **P. O. Huff,** freight and passenger agent at Phoenix, Ariz., has been appointed general agent, passenger department, at El Paso, Tex., to succeed **I. C. Bruce,** who has been transferred to Denver, to succeed **M. L. Mowry.** Mr. Mowry has been transferred to New York to replace Mr. Johnston.

W. D. Corfield, general freight agent of the Reading, and **Joseph A. Fisher,** assistant general freight agent, both with headquarters at Philadelphia, Pa., have been appointed assistant freight traffic managers. **H. B. Light,** assistant general freight agent at Philadelphia, has been appointed general freight agent, **John Wag-**

Continued on next left-hand page

A SMOOTH RUNNING

arch brick service



The splendid service from the smooth-running motor in your car is best appreciated when you see the grief a balky motor can create.

So, too, with Arch Brick. The smooth functioning service The American Arch Company renders is accepted as a matter-of-course.

But many elements, exclusive with The American Arch Company, are responsible for this service. The railroad background; the combustion knowledge; the years of arch brick study and brick arch design; the gradual perfection of a service of supply.

All these contribute to an Arch brick service that makes for brick arch economy and reliability of performance.

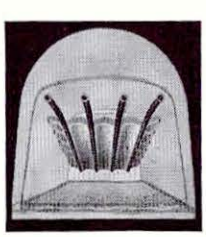
•

There's More To SECURITY ARCHES Than Just Brick

•

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists



AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

ner, Jr., industrial agent at Philadelphia, has been appointed assistant general freight agent and **J. W. Lawson** has been appointed industrial agent. **J. P. Stewart,** general agent at Wilmington, Del., has been appointed division freight agent at Williamsport, Pa., and **T. P. Refbord** has been appointed general agent at Wilmington.

George B. Rice, freight traffic manager of the Seaboard Air Line, with headquarters at Norfolk, Va., has been ap-

George B. Rice

pointed chief freight traffic officer with jurisdiction over the freight, express, agricultural and industrial departments. **Charles R. Capps,** chief traffic officer, has retired because of ill health, after 48 years of service with this company. Mr. Rice entered the service of the Seaboard Air Line in 1911 and served in various capacities in the general freight agent's office and the offices of the first vice-president in charge of traffic; in 1926 became assistant freight traffic manager. In 1929 Mr. Rice was appointed freight traffic manager, the position he held until his recent appointment as chief freight traffic officer.

R. H. Eberly, assistant freight traffic manager of the Seaboard Air Line, has been appointed freight traffic manager,

R. H. Eberly

with jurisdiction over the rate department, with headquarters as before at Norfolk, Va., succeeding **George B. Rice.** Mr. Eberly was graduated from Gettysburg College, Gettysburg, Pa., in 1899, and entered the service of the Seaboard Air Line in the freight department. He served successively as stenographer-rate clerk, assistant general freight agent, general freight agent and assistant freight traffic manager, the position he held until his recent appointment as freight traffic manager.

MECHANICAL

D. S. Ellis, mechanical assistant to the vice-president of the Chesapeake & Ohio, the New York, Chicago & St. Louis and the Pere Marquette, has been appointed chief mechanical officer of these roads and will report to the vice-presidents in charge of operation of the respective roads. In his new position Mr. Ellis takes over a portion of the duties of the late **W. G. Black,** vice-president in charge of purchasing, stores and mechanical matters. He will have his headquarters as before at Cleveland, Ohio. Mr. Ellis was born at Warwick, N. Y., on January 25, 1897, and attended the Warwick high school. In 1916 he became a clerk in the auditor's office of the Lehigh & Hudson River, and in the following year he was appointed a clerk in the office of the auditor of freight accounts of the New York Central. Later he served as a machinist and as an acting

D. S. Ellis

enginehouse foreman. In 1918 Mr. Ellis became a draftsman, serving in this position and as a setter, calculator, designer and traveling engineer until 1924. In that year he was appointed assistant engineer and in 1925 he was made assistant engineer of motive power. On May 1, 1929, Mr. Ellis was appointed eastern district manager, and subsequently manager, of the railroad division of the Worthington Pump & Machinery Corporation. On October 1, 1932, he resigned from the latter position to become engineer of motive power on the advisory mechanical committee of the Chesapeake & Ohio, the Erie, the New York, Chicago & St. Louis, and the Pere Marquette, with headquarters at Cleveland. Early this year he was appointed mechanical assistant to the vice-president of the C. & O., the Nickel Plate and the Pere Marquette, with the same headquarters, which position he was holding at the time of his recent appointment as chief mechanical officer of these roads.

ENGINEERING AND SIGNALING

A. B. Chaney, division engineer of the Missouri and Memphis divisions of the Missouri Pacific, with headquarters at Poplar Bluff, Mo., has been appointed district engineer of the Southern district, with headquarters at Little Rock, Ark., to succeed **J. Davis,** whose appointment as superintendent of the Arkansas division is noted elsewhere in these columns. **C. J. Jaeschke,** roadmaster of the St. Louis Terminal division, has been appointed division engineer of the Missouri and Memphis divisions at Poplar Bluff, to succeed Mr. Chaney.

OBITUARY

William G. Trufant, general agent for the Denver & Rio Grande Western at New York, died on July 11 in Colorado of acute indigestion while on his vacation.

Luther M. Parker, secretary of the United States Railway Labor Board at the time it was disbanded in 1926, died on July 19 at the Illinois Masonic hospital, Chicago, following a stroke.

Warren K. Cundiff, who retired in 1935 as assistant general passenger agent for the Union Pacific at Denver, Colo., died on July 10 in the Victoria hospital at London, Ont. Prior to becoming assistant general passenger agent at Denver in 1932, Mr. Cundiff had served for five years as general passenger agent at Portland, Ore. He had served in various capacities in the passenger traffic department of a number of railroads for 55 years, 30 of which had been spent in the service of the Union Pacific.

William W. Baldwin, who retired on January 1, 1929, as vice-president of the Chicago, Burlington & Quincy, died in a hospital at Evanston, Ill. (a suburb of Chicago), on July 18 at the age of 90 years. Mr. Baldwin was born at Keosauqua, Iowa, on September 28, 1845, and graduated from Iowa State university in 1866, and from the same school with a law degree in the following year. Mr. Baldwin practiced law at Burlington, Iowa, until 1879, when he entered railway service as land commissioner for the Iowa land department of the Burlington. Subsequently he served for a number of years as president of the St. Louis, Keokuk & Northwestern and other branches of the Burlington, and was one of the promoters of the Burlington & Northwestern. In 1890, he was made land commissioner of the Nebraska land department of the Burlington, and in the following year he was appointed assistant to the president. In 1909 he was appointed vice-president, with supervision over matters pertaining to taxation, land, telegraph and many of the general corporate and government relations of the company, holding this position until his retirement in 1928.

Table of Operating Revenues and Expenses appears on second left-hand page

The Superheater

AS A FACTOR IN LOCOMOTIVE DESIGN

Each of the following features is being discussed in this series of advertisements.

- Maximum Ton Miles per Hour
- Boiler Capacity and Tractive Effort
- Heating Surface and Boiler Capacity
- Heating Surface and Boiler Efficiency
- Minimum Draft Loss and Low Back Pressure
- High Sustained Superheat
- Higher Superheat and Minimum Steam Consumption
- Greater Sustained Capacity
- Reduced Fuel and Water Consumption per Unit of Work Done
- Total Fuel Consumption of American Railroads
- Reduced Cost of Locomotive Horsepower

For High Efficiencies Use Elesco Type "E" Superheaters

✓
✓
✓
✓
✓

5

Minimum Draft Loss and Low Back Pressures

A well-designed boiler for high steam output and high heat-absorbing efficiency must operate with a minimum draft loss and low back pressures.

A locomotive boiler properly designed and equipped with a type "E" superheater provides from 8% to 14% more actual flue heating surface, 50% to 80% more superheating surface and higher heat-absorbing efficiency than the same size of boiler equipped with a type "A" superheater.

In spite of this large increase in heating surface, evaporative capacity and efficiency, there is no appreciable increase in the required back pressures or draft loss.

THE SUPERHEATER COMPANY

Representative of American Throttle Company, Inc.

60 East 42nd Street
NEW YORK

ELESCO

Peoples Gas Building
CHICAGO

Canada: The Superheater Company, Limited, Montreal

Superheaters • Superheated Steam Pyrometers • Exhaust Steam Injectors • Feed Water Heaters • American Throttles

Locomotive 6400 is one of five partially streamlined locomotives built for heavy fast passenger service on the Canadian National Railways.

Weight on Drivers, 236,000 pounds; . . . . . Weight of Engine, 379,800 pounds
Cylinders, 24x30 inches; Diameter of Drivers, 77 inches; Boiler Pressure, 275 pounds
Maximum Tractive Power, 52,500 pounds.

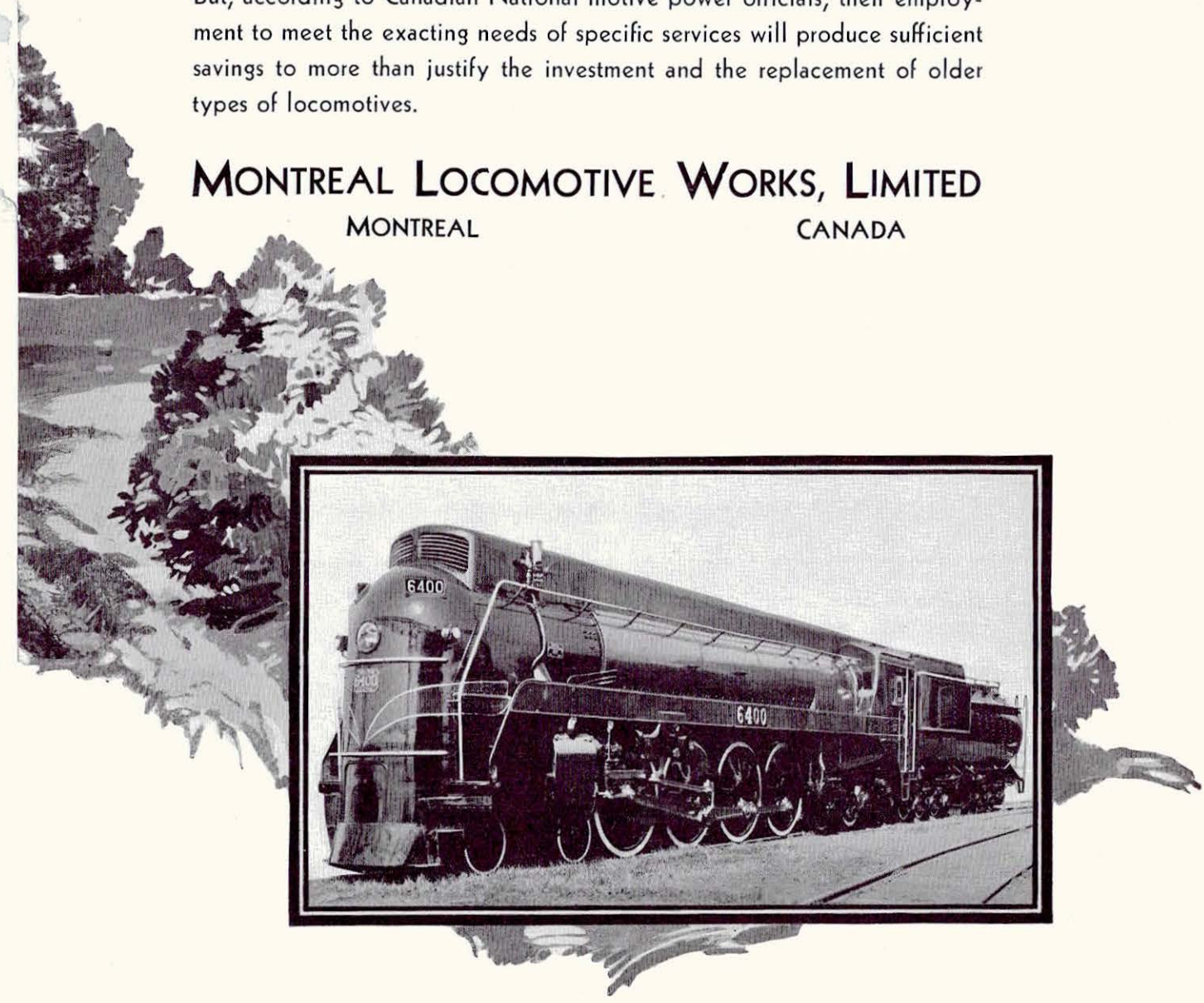
NEW POWER ON THE CANADIAN NATIONAL

THESE new locomotives, the largest streamlined steam engines in the world, will go into service on the route of the International Limited. They are capable of maintaining continuous runs from Montreal to Sarnia, a distance of 550 miles, and of greater uninterrupted mileage if necessary.

Their construction was part of a plan to provide increased employment. But, according to Canadian National motive power officials, their employment to meet the exacting needs of specific services will produce sufficient savings to more than justify the investment and the replacement of older types of locomotives.

MONTREAL LOCOMOTIVE WORKS, LIMITED

MONTREAL CANADA



Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled From 140 Monthly Reports of Revenues and Expenses Representing 144 Class I Steam Railways

FOR THE MONTH OF MAY, 1936 AND 1935

Item	United States		Eastern District		Southern District		Western District	
	1936	1935	1936	1935	1936	1935	1936	1935
Average number of miles operated	237,009	238,160	58,653	59,013	44,937	45,245	133,419	133,902
Revenues:								
Freight	$262,726,691	$224,905,837	$114,279,407	$98,317,065	$51,715,279	$43,737,721	$96,732,005	$82,851,051
Passenger	*b* 30,350,829	*c* 27,110,805	17,524,313	15,893,479	3,777,072	3,320,489	9,049,444	7,896,837
Mail	7,911,196	7,661,913	3,059,290	2,955,281	1,440,431	1,383,257	3,411,475	3,323,375
Express	6,226,916	7,412,248	2,471,888	3,082,379	1,400,532	1,604,558	2,354,496	2,725,311
All other transportation	6,909,048	6,182,492	3,707,374	3,399,178	696,218	586,483	2,505,456	2,196,831
Incidental	6,184,603	5,632,436	3,197,291	2,926,026	863,856	830,721	2,123,456	1,875,689
Joint facility—Cr.	908,707	820,408	259,405	229,707	236,090	221,126	413,212	369,575
Joint facility—Dr.	251,492	198,566	50,611	50,313	21,884	17,289	178,997	130,964
Railway operating revenues	320,966,498	279,527,573	144,448,357	126,752,802	60,107,594	51,667,066	116,410,547	101,107,705
Expenses:								
Maintenance of way and structures	40,759,922	34,649,696	14,701,035	12,870,343	6,726,732	6,356,083	19,332,155	15,423,270
Maintenance of equipment	63,861,075	57,033,921	28,532,929	25,043,511	11,539,639	10,879,763	23,788,507	21,110,647
Traffic	8,455,354	8,215,317	3,078,693	3,105,683	1,592,995	1,534,683	3,783,666	3,574,951
Transportation	111,881,377	103,195,616	51,332,276	47,224,750	18,594,741	17,554,350	41,954,360	38,416,516
Miscellaneous operations	2,648,093	2,415,404	1,189,624	1,111,948	312,701	279,197	1,145,768	1,024,259
General	13,002,240	4,131,318	5,708,890	4,241,588	2,194,660	1,877,936	5,098,690	*d* 1,988,206
Transportation for investment—Cr.	374,446	380,957	23,306	140,005	48,024	43,689	303,116	197,263
Railway operating expenses	240,233,615	209,260,315	104,520,141	93,457,818	40,913,444	38,438,323	94,800,030	77,364,174
Net revenue from railway operations	80,732,883	70,267,258	39,928,216	33,294,984	19,194,150	13,228,743	21,610,517	23,743,531
Railway tax accruals	27,403,968	20,756,448	11,507,366	8,761,243	5,409,991	4,319,576	10,486,611	7,675,629
Railway operating income	53,328,915	49,510,810	28,420,850	24,533,741	13,784,159	8,909,167	11,123,906	16,067,902
Equipment rents—Dr. balance	8,178,312	6,852,471	3,829,022	3,073,282	793,819	711,974	3,555,471	3,067,215
Joint facility rent—Dr. balance	3,308,456	3,059,828	1,739,557	1,708,067	449,838	369,038	1,119,061	982,723
Net railway operating income	*a* 41,842,147	*b* 39,598,511	22,852,271	19,752,392	12,540,502	7,828,155	6,449,374	12,017,964
Ratio of expenses to revenues (per cent)	74.85	74.86	72.36	73.73	68.07	74.40	81.44	76.52
Depreciation included in operating expenses	16,172,240	16,311,035	7,066,784	7,142,823	3,191,540	3,180,145	5,913,916	5,988,067
Total maintenance before depreciation	88,448,757	75,372,582	36,167,180	30,771,031	15,074,831	14,055,701	37,206,746	30,545,850
Net railway operating income before depreciation	58,014,387	55,909,546	29,919,055	26,895,215	15,732,042	11,008,300	12,363,290	18,006,031

FOR FIVE MONTHS ENDED WITH MAY, 1936 AND 1935

Item								
Average number of miles operated	237,069	238,257	58,670	59,017	44,946	45,258	133,453	133,982
Revenues:								
Freight	$1,257,174,176	$1,094,580,383	$550,941,817	$486,308,694	$254,216,833	$220,743,320	$452,015,526	$387,528,369
Passenger	*b* 157,523,577	*c* 139,731,714	90,264,313	82,413,109	23,624,768	20,402,103	43,634,496	36,916,502
Mail	38,278,040	37,681,470	14,664,117	14,478,066	6,921,200	6,723,524	16,692,723	16,479,880
Express	23,697,153	23,144,885	9,306,051	9,085,643	5,776,124	6,036,248	8,614,978	8,022,994
All other transportation	33,369,518	29,940,054	17,584,549	16,223,044	3,418,851	3,091,607	12,366,118	10,625,403
Incidental	28,910,080	26,242,977	15,760,598	14,194,228	4,626,947	4,327,965	8,522,535	7,720,784
Joint facility—Cr.	4,465,694	3,911,811	1,359,114	1,249,898	960,232	866,912	2,146,348	1,795,001
Joint facility—Dr.	1,180,885	1,025,418	251,685	292,220	105,036	84,560	824,164	648,638
Railway operating revenues	1,542,237,353	1,354,207,876	699,628,874	623,660,462	299,439,919	262,107,119	543,168,560	468,440,295
Expenses:								
Maintenance of way and structures	174,082,627	146,533,482	68,272,048	56,950,556	32,624,099	30,596,634	73,186,480	58,986,292
Maintenance of equipment	316,437,878	277,545,318	143,940,268	124,654,690	57,578,036	53,084,887	114,919,574	99,805,741
Traffic	40,400,200	38,787,856	14,863,098	14,496,226	8,070,785	7,576,085	17,466,317	16,665,545
Transportation	570,908,723	511,035,805	264,442,727	238,293,161	95,964,288	87,187,642	210,501,708	185,555,002
Miscellaneous operations	13,787,729	12,190,924	6,420,492	5,778,382	1,981,888	1,703,357	5,385,349	4,709,185
General	65,180,936	58,444,220	28,658,555	27,288,379	11,087,452	10,470,080	25,434,929	20,685,761
Transportation for investment—Cr.	1,228,218	1,092,011	139,317	271,226	132,479	138,537	956,422	682,248
Railway operating expenses	1,179,569,875	1,043,395,594	526,457,871	467,190,168	207,174,069	190,480,148	445,937,935	385,725,278
Net revenue from railway operations	362,667,478	310,812,282	173,171,003	156,470,294	92,265,850	71,626,971	97,230,625	82,715,017
Railway tax accruals	121,825,928	100,861,270	50,395,623	40,987,882	25,405,444	21,523,833	46,024,861	38,349,555
Railway operating income	240,841,550	209,951,012	122,775,380	115,482,412	66,860,406	50,103,138	51,205,764	44,365,462
Equipment rents—Dr. balance	37,183,113	34,547,435	17,790,967	16,898,362	2,215,405	2,490,698	17,176,741	15,158,375
Joint facility rent—Dr. balance	15,727,082	14,729,825	8,662,216	8,457,674	1,781,236	1,487,519	5,283,630	4,784,632
Net railway operating income	*a* 187,931,355	*b* 160,673,752	96,322,197	90,126,376	62,863,765	46,124,921	28,745,393	24,422,455
Ratio of expenses to revenues (per cent)	76.48	77.05	75.25	74.91	69.19	72.67	82.10	82.34
Depreciation included in operating expenses	80,695,113	81,227,852	35,116,444	35,278,827	15,979,962	15,870,752	29,598,707	30,078,273
Total maintenance before depreciation	409,825,392	342,850,948	177,095,872	146,326,419	74,222,173	67,810,769	158,507,347	128,713,760
Net railway operating income before depreciation	268,626,468	241,901,604	131,438,641	125,405,203	78,843,727	61,995,673	58,344,100	54,500,728

a Includes charges to Railway Tax Accruals in the total amount of $19,216,079, itemized as follows: $7,148,016 for taxes under the requirements of the Social Security Act of 1935, and $12,068,063 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes. (Public No. 400, 74th Congress.)

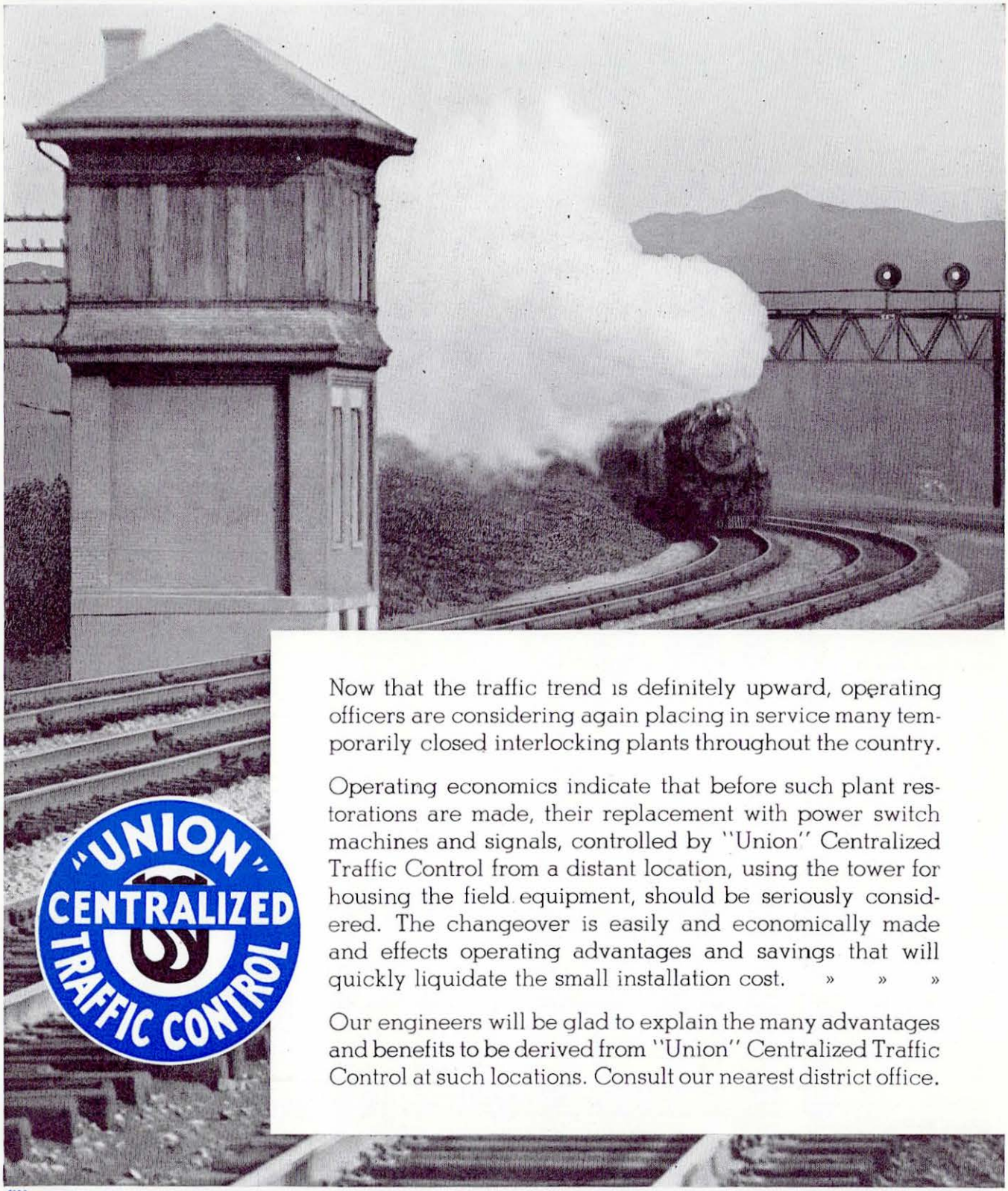
b Includes credits to General Expenses in the amount of $4,429,827 on account of reversal of charges previously made for liability under the Railroad Retirement Act of 1934.

d Deficit or other reverse items.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Table of Freight Operating Statistics begins on next left-hand page

OPERATING ECONOMICS ----



Now that the traffic trend is definitely upward, operating officers are considering again placing in service many temporarily closed interlocking plants throughout the country.

Operating economics indicate that before such plant restorations are made, their replacement with power switch machines and signals, controlled by "Union" Centralized Traffic Control from a distant location, using the tower for housing the field equipment, should be seriously considered. The changeover is easily and economically made and effects operating advantages and savings that will quickly liquidate the small installation cost. » » »

Our engineers will be glad to explain the many advantages and benefits to be derived from "Union" Centralized Traffic Control at such locations. Consult our nearest district office.

f103

1881 **Union Switch & Signal Co.** 1936

SWISSVALE, PA.

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

Freight Operating Statistics of Large Steam Railways—Selected Items for the Month of March,

Region, road, and year		Miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross, excluding locomotives and tenders	Ton-miles (thousands): Net, revenue and non-revenue	Number of road locomotives on line: Serviceable: Not stored	Serviceable: Stored	Unserviceable	Per cent unserviceable
New England Region:													
Boston & Albany	1936	373	130,198	135,682	10,224	3,100	70.4	159,126	55,103	59	1	32	34.8
	1935	402	126,680	131,434	8,837	3,084	69.3	159,877	54,981	51	4	41	42.7
Boston & Maine	1936	1,972	265,699	308,038	26,755	9,144	71.0	496,510	185,107	141	..	158	52.8
	1935	2,016	283,833	316,999	29,560	9,297	68.6	503,825	182,803	128	1	166	56.3
N. Y., New Hav. & Hartf.	1936	2,031	353,685	435,614	23,437	11,686	68.3	616,624	222,957	181	4	98	34.7
	1935	2,045	337,703	412,075	19,188	11,015	66.1	594,724	214,889	174	22	109	35.7
Great Lakes Region:													
Delaware & Hudson	1936	831	199,975	270,415	32,055	6,789	67.3	411,493	194,168	93	153	39	13.7
	1935	835	210,586	287,457	32,709	7,141	62.4	451,383	208,485	95	150	40	14.0
Del., Lack. & Western	1936	992	351,371	392,103	50,970	11,354	68.0	645,554	246,514	155	2	86	35.4
	1935	992	348,118	389,536	47,879	11,447	66.9	660,358	258,697	127	51	83	31.8
Erie (incl. Chi. & Erie)	1936	2,298	707,035	744,009	45,661	29,204	65.9	1,717,590	644,809	207	39	232	48.5
	1935	2,305	661,279	692,781	41,041	27,541	63.6	1,685,621	645,415	200	95	181	38.0
Grand Trunk Western	1936	1,027	278,859	283,015	2,345	7,338	63.5	441,424	158,613	80	..	60	42.9
	1935	1,007	247,775	250,684	3,268	6,717	59.8	409,535	137,465	70	..	70	50.0
Lehigh Valley	1936	1,318	390,209	416,353	45,506	12,636	65.2	759,838	297,677	144	..	163	53.1
	1935	1,335	384,781	408,964	36,031	11,753	63.1	720,883	272,801	143	19	146	47.4
New York Central	1936	10,789	2,823,192	2,980,147	187,511	91,377	59.3	5,879,072	2,358,650	898	62	551	36.5
	1935	11,066	2,611,864	2,735,802	177,567	89,088	60.8	5,742,879	2,384,417	821	46	638	42.4
N. Y., Chi. & St. Louis	1936	1,674	520,559	524,351	8,281	17,226	63.1	1,036,655	385,100	154	12	23	12.2
	1935	1,661	451,015	453,436	4,985	15,451	62.5	951,439	368,122	124	53	14	7.3
Pere Marquette	1936	2,081	417,388	430,796	8,196	10,300	60.2	663,252	248,226	116	2	38	24.4
	1935	2,096	372,072	391,403	4,699	9,355	59.3	607,956	226,043	109	2	42	27.5
Pitts. & Lake Erie	1936	234	66,860	69,311	....	2,390	54.5	206,917	109,011	35	4	32	45.1
	1935	234	75,412	77,708	38	3,070	56.8	262,192	142,367	27	6	38	53.5
Wabash	1936	2,435	599,377	610,196	13,247	18,038	63.8	1,058,919	361,889	136	20	152	49.4
	1935	2,435	609,627	620,776	11,900	18,414	61.2	1,092,568	360,639	132	22	179	53.8
Central Eastern Region:													
Baltimore & Ohio	1936	6,367	1,405,087	1,723,651	179,857	40,953	62.2	2,779,079	1,242,028	650	25	630	48.3
	1935	6,321	1,408,305	1,724,415	196,546	42,464	61.0	2,936,148	1,337,430	621	114	570	43.7
Central of New Jersey	1936	681	143,729	162,621	31,670	4,459	60.2	296,550	134,803	55	10	90	58.1
	1935	684	134,379	150,449	29,713	4,513	58.5	312,447	144,719	60	12	85	54.1
Chicago & Eastern Illinois	1936	931	185,945	186,755	3,137	4,458	62.7	287,891	121,317	57	..	53	48.2
	1935	939	178,524	179,755	2,831	4,331	61.2	293,256	127,264	45	4	58	54.2
Elgin, Joliet & Eastern	1936	434	96,293	98,593	2,015	2,521	60.3	193,589	95,459	58	..	29	33.3
	1935	446	94,569	96,006	726	2,286	58.8	184,195	91,379	50	7	30	34.9
Long Island	1936	393	29,557	30,195	15,850	289	51.6	22,021	8,277	31	4	16	31.4
	1935	393	31,693	32,786	13,848	317	54.0	23,219	8,944	35	..	22	38.6
Pennsylvania System	1936	9,801	2,802,191	3,215,909	368,429	92,805	61.4	6,311,323	2,744,469	1,421	79	892	37.3
	1935	10,009	2,825,241	3,177,476	355,544	98,092	61.0	6,754,449	3,036,767	1,293	166	970	39.9
Reading	1936	1,449	399,026	435,280	50,534	10,739	60.1	769,532	358,541	196	76	84	23.6
	1935	1,452	391,865	427,101	49,916	11,624	59.4	844,770	401,511	185	82	101	27.4
Pocahontas Region:													
Chesapeake & Ohio	1936	3,050	823,745	869,475	33,620	33,355	53.4	2,815,913	1,467,137	393	62	75	14.2
	1935	3,057	842,284	892,801	40,381	37,143	55.9	3,166,451	1,717,583	380	92	92	16.3
Norfolk & Western	1936	2,145	636,025	673,574	34,736	24,574	57.9	2,036,767	1,048,029	238	80	59	15.6
	1935	2,146	645,720	682,800	34,146	25,785	58.6	2,161,718	1,136,990	243	97	36	9.5
Southern Region:													
Atlantic Coast Line	1936	5,101	640,532	641,774	8,343	14,042	60.3	784,963	261,668	249	21	143	34.6
	1935	5,148	603,709	606,727	8,966	13,641	59.3	753,947	251,644	269	41	133	30.0
Central of Georgia	1936	1,886	262,174	265,668	3,424	5,583	71.2	309,403	119,044	92	..	32	25.8
	1935	1,886	232,665	234,158	3,512	5,332	71.2	287,916	110,897	100	..	41	29.1
Illinois Central (incl. Y. & M. V.)	1936	6,566	1,583,910	1,596,689	29,820	36,857	61.6	2,382,054	954,599	621	10	224	26.2
	1935	6,587	1,461,831	1,469,053	28,627	35,661	62.7	2,336,315	995,458	594	4	328	35.4
Louisville & Nashville	1936	5,007	1,042,153	1,123,568	27,089	22,966	58.2	1,608,644	730,193	316	30	227	39.6
	1935	5,049	1,001,702	1,082,294	28,314	22,780	60.6	1,591,047	766,951	313	8	257	44.5
Seaboard Air Line	1936	4,295	518,229	532,148	4,753	13,040	66.0	747,004	265,757	214	..	114	34.8
	1935	4,295	511,925	525,498	3,562	12,660	64.4	730,690	248,730	229	7	108	31.4
Southern	1936	6,596	1,218,279	1,235,410	20,211	28,186	68.5	1,535,754	598,837	439	38	321	40.2
	1935	6,599	1,165,546	1,184,127	21,114	26,836	65.7	1,509,199	585,016	411	87	340	40.6
Northwestern Region:													
Chicago & North Western	1936	8,355	1,075,804	1,146,538	30,321	25,847	61.5	1,602,486	556,383	362	123	260	34.9
	1935	8,428	899,852	944,725	23,484	22,836	63.8	1,397,696	490,974	402	107	271	34.7
Chicago Great Western	1936	1,458	245,365	245,879	15,097	7,229	62.5	443,389	163,009	75	1	13	14.6
	1935	1,456	230,617	230,844	4,255	6,539	59.1	411,132	143,547	62	4	40	37.7
Chi., Milw., St. P. & Pac.	1936	11,115	1,356,120	1,451,277	63,801	35,193	60.6	2,262,062	893,359	456	101	139	20.0
	1935	11,120	1,207,498	1,269,762	58,917	31,866	60.5	2,022,603	800,819	383	105	207	29.8
Chi., St. P., Minneap. & Om.	1936	1,637	227,399	241,094	11,742	4,669	63.2	293,068	118,576	68	39	37	25.5
	1935	1,644	194,422	201,170	9,395	4,099	64.8	246,739	89,888	60	51	49	30.5
Great Northern	1936	8,093	745,197	744,281	27,081	22,946	64.1	1,446,920	578,642	348	69	181	30.3
	1935	8,041	672,284	679,275	24,536	20,683	64.7	1,263,057	498,162	335	87	183	30.2
Minneap., St. P. & S. St. M.	1936	4,273	383,305	391,671	5,736	8,407	67.8	489,099	198,127	120	..	38	24.1
	1935	4,274	355,088	359,579	2,963	7,089	63.7	403,788	153,535	112	..	39	25.8
Northern Pacific	1936	6,423	639,810	701,484	49,318	19,714	72.2	1,135,712	492,124	327	17	102	22.9
	1935	6,416	575,859	634,822	47,187	18,137	69.0	1,039,054	424,901	330	21	104	22.9
Central Western Region:													
Alton	1936	928	198,672	201,182	1,807	4,280	61.4	275,516	99,314	71	1	30	29.4
	1935	921	192,874	196,860	2,311	3,985	56.4	274,644	97,518	45	2	44	48.2
Atch., Top. & S. Fe (incl. G.C. & S.F. & P. & S.F.)	1936	13,235	1,700,723	1,837,567	75,246	48,064	66.7	2,833,314	971,569	527	99	358	36.4
	1935	13,307	1,562,666	1,644,917	60,044	43,028	63.6	2,579,851	849,877	476	149	377	37.6
Chicago, Burl. & Quincy	1936	8,969	1,342,494	1,404,915	48,415	34,210	60.7	2,069,388	837,989	445	2	97	17.8
	1935	8,971	1,199,538	1,250,217	38,413	31,119	61.2	1,857,844	767,768	451	5	120	20.8
Chi., Rock I. & Pac. (incl. Chi., Rock I. & Gulf)	1936	8,176	1,213,099	1,241,341	6,508	26,807	61.3	1,645,706	582,235	374	5	341	47.4
	1935	8,273	1,099,395	1,110,337	4,463	24,100	59.1	1,491,839	505,394	354	21	353	48.5
Denv. & Rio Gr. Western	1936	2,584	254,350	278,967	27,439	6,607	69.2	396,899	168,642	153	18	46	21.6
	1935	2,602	206,939	225,258	22,471	5,429	63.8	335,871	135,027	149	15	54	24.8
Southern Pac.—Pac. Lines	1936	8,596	1,306,143	1,418,458	159,753	42,559	63.4	2,652,222	893,676	447	84	248	31.8
	1935	8,604	1,077,820	1,163,133	123,082	35,831	62.1	2,226,036	731,448	362	164	273	34.2
Union Pacific†	1936	9,829	1,661,410	1,726,137	105,713	51,879	64.9	3,105,129	1,103,362	560	73	248	28.1
	1935	9,854	1,582,464	1,654,672	105,863	49,303	65.3	2,906,241	1,065,578	548	103	238	26.8
Southwestern Region:													
Mo.-Kans.-Texas Lines	1936	3,282	379,457	384,675	6,273	10,145	60.7	619,297	208,886	101	25	81	39.1
	1935	3,282	345,775	348,393	4,927	8,978	59.7	550,386	184,293	83	30	80	41.4
Missouri Pacific	1936	7,201	1,176,986	1,217,426	26,076	33,363	62.3	2,092,102	770,134	316	96	139	25.2
	1935	7,208	1,097,192	1,131,165	25,349	29,322	63.5	1,832,936	714,088	271	109	179	32.0
St. Louis-San Francisco	1936	4,888	682,326	686,923	8,820	14,662	62.9	893,529	347,118	269	103	71	16.0
	1935	4,993	630,924	636,307	8,915	13,353	61.7	810,215	306,811	266	153	65	13.4
St. Louis Southw. Lines	1936	1,768	277,115	281,001	3,656	7,867	62.2	467,867	157,213	100	7	11	9.3
	1935	1,774	269,498	272,917	3,617	6,794	60.4	404,135	129,372	99	10	11	9.2
Texas & New Orleans	1936	4,415	555,660	556,381	4,412	13,483	63.0	850,328	299,666	198	40	58	19.6
	1935	4,429	525,172	525,389	5,464	12,161	62.3	751,488	261,662	178	72	57	18.6
Texas & Pacific	1936	1,945	286,443	286,443	1,457	8,623	58.6	546,505	173,855	61	61	98	44.5
	1935	1,945	261,834	261,834	1,730	7,720	58.9	483,747	155,913	78	73	68	31.2

NOTE:—Effective with carrier reports for the month of January, 1936, the rules relative to operating statistics of large steam railways were revised with the following effect on this statement: Miles of road operated, number of locomotives on line, and number of freight cars on line were changed from averages for the month to actual figures as of the close of the month. Freight train and locomotive-miles, which formerly applied only to freight trains and the freight proportion of mixed trains, based on car-miles, were changed to apply to freight trains and all mixed trains handling more freight-train cars than passenger-train cars. Carriers were not required to rework 1935 figures according to the revised rules, but they have in some cases supplied considerable data. In other cases, the figures shown in this statement for last year were restated by the carriers from last years' reports, or inserted from such reports by the Bureau of Statistics.

* Not available.

† Includes Los Angeles & Salt Lake, Oregon Short Line, Oregon-Washington R. R. & Navigation Co., and St. Joseph & Grand Island, leased January 1, 1936.

1936, Compared with March, 1935, for Roads with Annual Operating Revenues Above $25,000,000

Region, road, and year	Number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
New England Region:													
Boston & Albany.....1936	2,289	5,104	7,393	21.0	19,655	1,229	426	17.8	242	19.3	4,765	166	51.2
1935	2,828	3,740	6,568	26.1	21,365	1,265	435	17.8	270	21.8	4,415	161	47.1
Boston & Maine.....1936	8,066	13,465	21,531	11.4	23,259	1,891	705	20.2	309	21.5	3,028	110	36.1
1935	9,004	6,318	15,322	15.0	25,384	1,784	647	19.7	384	28.5	2,926	110	38.4
N. Y., New Hav. & Hartf..1936	13,006	13,652	26,658	17.0	24,808	1,791	648	19.1	274	21.1	3,541	114	51.7
1935	14,672	10,273	24,945	15.3	25,762	1,787	646	19.5	278	21.0	3,390	110	45.7
Great Lakes Region:													
Delaware & Hudson.....1936	9,937	3,008	12,945	3.6	29,085	2,074	979	28.6	532	27.6	7,539	115	34.5
1935	12,375	3,104	15,479	4.5	30,782	2,157	996	29.2	455	24.9	8,051	114	36.9
Del., Lack. & Western....1936	14,554	5,902	20,456	15.8	30,408	1,867	713	21.7	383	26.0	8,018	141	59.6
1935	16,683	4,689	21,372	12.2	31,821	1,919	752	22.6	392	25.9	8,414	139	53.4
Erie (incl. Chi. & Erie)....1936	16,703	14,391	31,094	5.3	40,502	2,443	917	22.1	634	43.6	9,053	106	53.3
1935	24,307	12,841	37,148	6.7	42,367	2,560	980	23.4	560	37.5	9,033	101	49.5
Grand Trunk Western....1936	3,888	7,171	11,059	15.3	30,578	1,599	575	21.6	435	31.7	4,981	110	66.0
1935	4,273	8,219	12,492	16.4	30,985	1,659	557	20.5	351	28.7	4,405	109	58.3
Lehigh Valley 1936	12,159	7,863	20,022	9.3	33,932	1,990	780	23.6	448	29.1	7,285	134	49.7
1935	14,542	4,917	19,459	8.5	34,615	1,915	725	23.2	444	30.3	6,590	141	46.6
New York Central.....1936	104,181	64,195	168,376	18.2	34,255	2,112	847	25.8	441	28.8	7,052	100	67.8
1935	*	*	183,191	18.2	36,853	2,222	922	26.8	422	26.0	6,950	107	62.3
N. Y., Chi. & St. Louis...1936	6,384	7,140	13,524	3.4	35,060	1,997	742	22.4	847	60.0	7,420	100	90.9
1935	9,008	6,966	15,974	3.4	36,847	2,110	816	23.8	738	49.5	7,151	95	77.4
Pere Marquette 1936	8,478	6,510	14,988	4.7	26,090	1,597	598	24.1	477	32.9	3,847	106	93.5
1935	10,817	5,931	16,748	3.2	27,666	1,637	609	24.2	429	30.0	3,479	101	82.2
Pitts. & Lake Erie.....1936	13,709	12,295	26,004	40.3	40,343	3,110	1,638	45.6	140	5.6	15,039	102	31.5
1935	14,191	8,931	23,122	45.2	48,935	3,478	1,889	46.4	189	7.2	19,653	101	35.3
Wabash 1936	10,191	8,957	19,148	4.0	35,177	1,789	611	20.1	576	44.9	4,795	117	65.3
1935	12,122	9,402	21,524	2.8	36,836	1,812	598	19.6	537	44.8	4,779	118	61.5
Central Eastern Region:													
Baltimore & Ohio: 1936	65,001	27,883	92,884	16.8	25,169	2,012	899	30.3	431	22.9	6,293	152	47.1
1935	75,627	20,812	96,439	17.8	27,179	2,115	963	31.5	447	23.3	6,826	151	47.5
Central of New Jersey.....1936	11,012	8,439	19,451	33.6	24,678	2,158	981	30.2	205	11.3	6,384	157	40.4
1935	13,011	7,313	20,324	28.2	28,879	2,379	1,102	32.1	224	12.0	6,825	146	36.8
Chicago & Eastern Illinois.1936	3,379	3,036	6,415	6.6	27,642	1,561	658	27.2	587	34.4	4,202	135	55.7
1935	3,426	2,826	6,252	8.3	28,830	1,657	719	29.4	657	36.5	4,372	126	55.0
Elgin, Joliet & Eastern.....1936	8,338	3,971	12,309	4.9	17,246	2,061	332	37.9	250	11.0	7,094	123	37.3
1935	8,165	3,251	11,416	7.3	17,786	1,991	235	40.0	259	11.0	6,607	118	35.9
Long Island 1936	651	3,486	4,137	2.1	5,642	762	287	28.6	65	4.4	680	325	28.8
1935	763	3,132	3,895	3.9	5,777	749	288	28.2	75	4.9	735	319	26.4
Pennsylvania System 1936	197,709	69,584	267,293	16.1	30,057	2,310	1,004	29.6	337	18.5	9,033	128	48.0
1935	237,437	45,535	282,972	14.6	34,365	2,434	1,094	31.0	345	18.3	9,787	125	46.7
Reading 1936	28,704	12,780	41,484	9.1	23,149	1,936	902	33.4	289	14.4	7,982	156	44.5
1935	33,231	9,633	42,864	7.0	28,355	2,163	1,028	34.5	311	15.2	8,920	141	43.0
Pocahontas Region:													
Chesapeake & Ohio.....1936	43,691	10,515	54,206	1.3	47,961	3,474	1,810	44.0	1,006	42.8	15,518	86	55.2
1935	42,179	11,223	53,402	1.7	52,603	3,795	2,059	46.2	1,149	44.4	18,123	79	53.0
Norfolk & Western.....1936	34,109	5,486	39,595	1.9	46,576	3,234	1,664	42.6	965	39.0	15,762	109	60.7
1935	32,681	4,157	36,838	2.7	49,586	3,385	1,781	44.1	986	38.1	17,090	104	61.2
Southern Region:													
Atlantic Coast Line.....1936	20,199	9,701	29,900	18.9	20,984	1,230	410	18.6	284	25.2	1,655	115	50.5
1935	25,238	8,046	33,284	17.5	21,029	1,250	417	18.4	245	22.4	1,577	113	45.1
Central of Georgia.....1936	3,820	3,273	7,093	6.7	21,306	1,191	458	21.3	541	35.7	2,036	126	70.0
1935	6,350	2,984	9,334	23.5	22,340	1,244	479	20.8	383	25.9	1,897	130	54.4
Illinois Central (incl. Y. 1936	39,014	18,906	57,920	31.7	25,314	1,514	607	25.9	512	32.1	4,690	141	61.3
& M. V.).....1935	41,618	15,176	56,794	34.7	26,863	1,611	686	27.9	560	32.0	4,875	132	52.2
Louisville & Nashville.....1936	39,761	8,802	48,563	22.0	23,550	1,548	703	31.8	523	28.3	4,704	141	64.2
1935	43,321	7,374	50,695	32.7	24,433	1,596	769	33.7	482	23.6	4,900	142	62.0
Seaboard Air Line.....1936	9,542	6,800	16,342	2.2	23,744	1,463	520	20.4	537	39.9	1,996	122	52.5
1935	11,072	5,958	17,030	3.6	23,229	1,446	492	19.6	485	38.3	1,868	123	49.6
Southern 1936	22,237	18,175	40,412	13.8	20,584	1,267	494	21.2	466	32.1	2,929	155	50.7
1935	27,682	15,955	43,637	14.9	21,318	1,303	505	21.8	440	30.7	2,860	152	46.4
Northwestern Region:													
Chicago & North Western..1936	38,054	19,902	57,956	8.0	22,017	1,495	519	21.5	277	20.9	2,148	136	50.0
1935	40,479	19,844	60,323	8.3	23,691	1,559	548	21.5	259	18.9	1,879	116	40.0
Chicago Great Western.....1936	1,664	3,445	5,109	2.7	27,790	1,809	665	22.6	770	54.6	3,607	142	94.6
1935	2,474	2,912	5,386	5.2	32,999	1,786	624	22.0	839	64.7	3,180	134	79.2
Chi., Milw., St. P. & Pac..1936	43,458	18,383	61,841	3.3	25,312	1,677	662	25.4	433	28.1	2,593	130	70.0
1935	50,800	15,522	66,322	2.8	26,571	1,681	666	25.1	390	25.6	2,323	127	61.7
Chi., St. P., Minneap. & Om.1936	3,496	4,813	8,309	8.6	16,384	1,300	526	25.4	393	24.4	2,337	128	55.8
1935	2,112	6,651	8,763	10.7	18,455	1,270	463	21.9	324	22.8	1,764	128	42.1
Great Northern 1936	37,860	11,097	48,957	9.4	27,651	1,951	780	25.2	387	23.9	2,307	132	42.5
1935	42,350	9,307	51,657	8.3	28,482	1,887	744	24.1	312	20.0	1,998	139	37.5
Minneap., St. P. & S. St. M.1936	12,047	4,168	16,215	5.3	19,600	1,285	521	23.6	382	23.9	1,496	113	82.7
1935	13,692	3,131	16,823	6.2	18,080	1,143	434	21.7	291	21.1	1,159	121	74.0
Northern Pacific 1936	27,894	5,206	33,100	12.1	26,994	1,781	772	25.0	479	26.6	2,471	159	54.3
1935	33,863	4,212	38,075	11.4	27,462	1,815	742	23.4	355	22.0	2,136	159	48.8
Central Western Region:													
Alton 1936	2,330	6,457	8,787	24.2	32,081	1,392	502	23.2	363	25.5	3,451	103	63.6
1935	3,269	5,935	9,204	28.2	31,678	1,427	507	24.5	346	25.0	3,415	121	75.5
Atch., Top. & S. Fe (incl. 1936	65,525	12,780	78,305	12.2	31,566	1,668	572	20.2	398	29.6	2,368	125	62.4
G.C. & S.F. & P. & S.F.).1935	75,230	9,797	85,027	13.8	31,134	1,653	545	19.8	320	25.5	2,060	128	54.9
Chicago, Burl. & Quincy...1936	27,984	14,609	42,593	8.4	26,701	1,548	627	24.5	616	41.4	3,014	132	86.1
1935	33,189	11,991	45,180	9.2	27,820	1,555	643	24.7	546	36.1	2,761	128	72.1
Chi., Rock I. & Pac. (incl. 1936	25,037	12,095	37,132	13.0	23,710	1,362	482	21.7	479	36.0	2,297	143	55.7
Chi., Rock I. & Gulf)....1935	31,542	11,150	42,692	20.5	23,748	1,359	460	21.0	382	30.8	1,965	144	49.3
Denv. & Rio Gr. Western..1936	12,924	3,157	16,081	6.2	25,081	1,567	666	25.5	349	19.8	2,105	164	47.1
1935	12,827	2,397	15,224	6.2	25,261	1,627	654	24.9	282	17.7	1,674	163	36.3
Southern Pac.—Pac. Lines.1936	32,966	23,600	56,566	9.7	33,234	2,044	689	21.0	512	38.4	3,354	109	64.9
1935	34,378	23,677	58,055	9.1	33,317	2,076	682	20.4	434	42.6	2,746	109	55.5
Union Pacific† 1936	39,439	16,836	56,275	15.0	38,587	1,877	667	21.3	627	45.4	3,621	129	67.0
1935	43,882	16,458	60,340	18.0	38,138	1,849	678	21.6	571	40.5	3,488	121	63.5
Southwestern Region:													
Mo.-Kans.-Texas Lines 1936	4,682	5,087	9,769	3.2	30,393	1,633	551	20.6	699	56.0	2,053	92	61.2
1935	5,706	2,991	8,697	3.4	29,129	1,593	534	20.5	678	55.4	1,812	84	58.4
Missouri Pacific 1936	15,023	18,618	33,641	3.5	31,830	1,783	656	23.1	699	48.5	3,450	124	73.2
1935	18,803	17,329	36,132	3.5	30,495	1,678	654	24.4	632	40.8	3,196	131	66.3
St. Louis-San Francisco....1936	18,830	7,381	26,211	6.2	24,619	1,312	510	23.7	427	28.7	2,291	140	50.7
1935	21,158	4,647	25,805	7.4	23,784	1,287	487	23.0	384	27.1	1,982	139	43.0
St. Louis Southw. Lines...1936	2,968	2,983	5,951	4.5	31,179	1,691	568	20.0	823	66.2	2,869	93	77.2
1935	3,525	2,978	6,503	7.4	28,440	1,504	481	19.0	658	57.2	2,353	100	74.3
Texas & New Orleans.....1936	7,198	12,561	19,759	7.4	27,783	1,539	542	22.2	497	35.5	2,189	87	60.5
1935	7,479	10,449	17,928	8.5	26,589	1,440	501	21.5	468	34.9	1,906	92	55.8
Texas & Pacific.....1936	2,365	5,213	7,578	3.5	31,007	1,914	609	20.2	774	65.5	2,883	90	42.2
1935	2,981	3,856	6,837	6.4	30,551	1,849	596	20.2	718	60.5	2,585	90	38.8

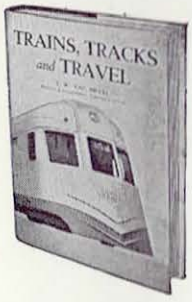
Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Valuable Books for Your Library

New Fourth Edition
Trains, Tracks and Travel

By T. W. VAN METRE

Professor of Transportation, Columbia University



The new edition of this popular book on railroads describes latest practice. There is a complete new chapter on streamlined trains and additions to others covering the new developments in air brakes, air conditioning of passenger cars and in high-speed Diesel and electric locomotives. Among the numerous new illustrations are shown the new streamlined trains. This is an excellent book for a boy who wants to know more about railroads and for the average reader.

Contents

Our Steam Railroads—The Railroad Track—The Steam Locomotive—Electric Locomotives; Gasoline and Oil Motors—Freight Cars—Passenger Train Cars—Tomorrow's Trains Become Today's—Passenger Stations and Terminals—The Operation of Trains.

1936. 4th. 312 pages, 276 illus., 7 x 9½ in., cloth, $3.00

Analysis of Railroad Operations

By J. L. WHITE

Formerly Assistant Comptroller, United States Railroad Administration; Director, Section of Transportation Service—Federal Co-ordinator of Transportation

Without going into the details of accounting procedure, Mr. White clearly explains the accepted method of analyzing and interpreting railroad statistical data. He describes how the figures produced in accounting departments should be used in the study of railroad operating results; how these figures reflect the various activities of the railroad and its efficient or inefficient operation as a whole or in any of its departments.

Classifications of the Interstate Commerce Commission are shown in full and frequent references are made to them in the main text.

1925. 391 pages, forms, index, work sheet, and the Jan. 1, 1935, order of the I. C. C., 6 x 9 inches, cloth. $4.00

SIMMONS-BOARDMAN
FREE EXAMINATION COUPON

SIMMONS-BOARDMAN PUBLISHING CO.

30 CHURCH STREET, NEW YORK, N. Y.

Please send prepaid for ten days' free examination the books checked below. If satisfactory I will remit the list price. Otherwise I will return the books without obligation.

( ) Trains, Tracks and Travel
( ) Analysis of Railroad Operations
( ) Who's Who in Railroading
( ) United States Safety Appliances
( ) When Railroads Were New
( ) Transportation Glossary

Name .....

Address .....

City .....

State .....

Company .....

Position .....

(This offer is limited to the United States and Canada) R. A. 7-25-36

United States Safety Appliances

(A. A. R. Edition)

The 14th edition of this book contains all the new laws, I. C. C. rulings and A. A. R. specifications since the last edition in 1928. More than 250,000 of these books have been sold.

1935. 121 pages, 49 drawings, 7½ x 3¾, imitation leather, $1.00

When Railroads Were New

By CHARLES FREDERICK CARTER

A fascinating human interest story of the early American and Canadian railroads and of the men who built and ran them. The author, an old railroad man, tells of the beginnings of the Erie, the Pennsylvania, the Baltimore and Ohio, the New York Central, the first Pacific railroad, the Santa Fe, the Rio Grande, the Canadian Pacific and other lines. It is illustrated with reproduction of wood cuts of early locomotives and railroad scenes.

1926. 4th (Centenary). 338 pages, 17 illustrations, 6 x 9 inches, cloth. $2.50

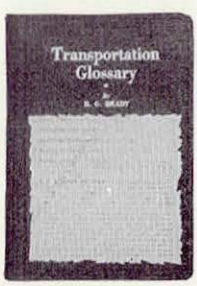
Who's Who in Railroading

The 9th Edition of what was formerly the "Biographical Directory of Railway Officials of America" is based upon a complete resurvey of the field by means of original questionnaires. Biographical sketches of some 4,000 railroad officials, equipment manufacturers, economists, members of regulatory commissions and others whose work is directly connected with the railroad industry of North America are presented. The descriptions of these leaders of the rail industry include personal information, such as their family connections and social, religious and political affiliations, as well as a complete outline of their professional careers.

1930. 579 pages, 6 x 9 x 1⅝ inches, cloth. $3.00

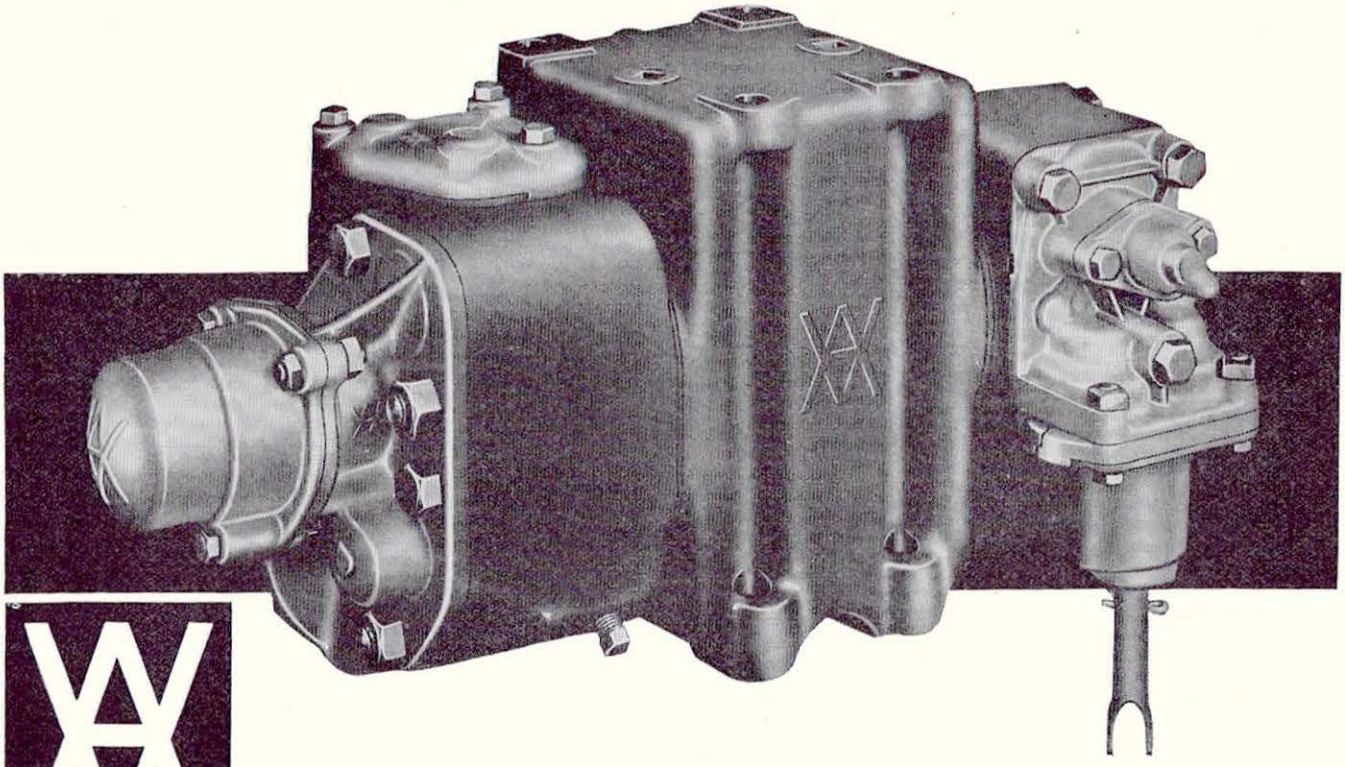
Transportation Glossary

By H. G. BRADY



Technical and semi-technical terms, phrases and expressions in more common use in railway, highway, air and marine transportation, and in port traffic are concisely defined in this handy reference book. Ordinary dictionaries, thesauri and law book sources furnish little information on transportation terms and this book fills a long felt need. It is printed in large clear type and cross references facilitate quick tracing of desired information.

1929. 119 pages, 5 x 7 inches, flexible. $1.75



The "AB" Brake has Proved its Merits

Recognition of a problematic situation . . . Development of a practical means for solution . . . Realization of the anticipated advantages—this is the sequence through which every worthwhile achievement has progressed.

More stringent and exacting operating conditions demanded a freight brake of greater effectiveness and efficiency . . . The Westinghouse "AB" Equipment was developed to embody the predetermined characteristics . . . Extensive service results have amply demonstrated the merits of this brake in meeting present-day requirements.

WESTINGHOUSE AIR BRAKE CO.

GENERAL OFFICE AND WORKS . . . WILMERDING, PA.

MAGNUS COMPANY

(INCORPORATED)

Journal Bearings

AND

Bronze Engine Castings

New York **Chicago**

PANTASOTE and AGASOTE

Are the Outstanding Favorites

on the New

STREAMLINED TRAINS

FOR more than 40 years Agasote and Pantasote have demonstrated their utility, durability and economy by rendering eminently satisfactory service in passenger equipment. It was but logical, therefore, that these two superior materials should have been selected for the 1300 new Eighth Avenue subway cars and used on practically all the new streamlined trains.

THE PANTASOTE CO., Inc.

250 Park Avenue, New York City

683 Atlantic Ave. BOSTON
751 Monadnock Bldg. SAN FRANCISCO
1355 Peachtree St., N. E. ATLANTA, GA.
1402 Lyons Ave. HOUSTON
Peoples Gas Bldg. CHICAGO

Selling Agents for

THE PANTASOTE LEATHER CO.
PASSAIC, N. J.
and
THE AGASOTE MILLBOARD CO.
TRENTON, N. J.
(In the Railroad & Marine Field)

GET TOGETHER DEPARTMENT

EDUCATIONAL

THE Railway Educational Bureau, Omaha, Neb., offers a distinctive education service for Supervisors and other employees. Write for FREE Special Bulletin.

FOR SALE

1000 car sets 70-ton ANDREWS full "U" Truck Frames. Cheap.

Also, Trucks complete.

Iron & Steel Products, Inc.
Railway Exchange Chicago

FOR SALE

STEEL DUMP CARS
Air Operated
EIGHT—20-yd. WESTERN, built 1929
THREE — 30-yd. CLARK, built 1923
TEN — 10-yd. WESTERN, built 1927
In unusually good condition
Iron & Steel Products, Inc.
Railway Exchange Chicago
"Anything so long as it contains Iron or Steel"

BETTENDORF U TYPE CAST STEEL 30 TON SIDE FRAMES

These side frames are in unusually good condition, and can be purchased at a very attractive price. All kinds of reclaimed, reconditioned Freight Car Parts—Storage Tanks—Send Us Your Inquiries—

ERMAN - HOWELL & CO., INC.,
332 So. Michigan Ave., Chicago, Ill.

VAPOR Products

STEAM COUPLERS ARA Standard
VAPOR SYSTEM Thermostatic Control
FLEXIBLE CONDUITS In place of Steam Hose
CONTROLS for Air Conditioning

VAPOR CAR HEATING CO., Inc.
RAILWAY EXCHANGE, CHICAGO

IRON & STEEL PRODUCTS, Inc.

Railway Exchange
Chicago, Illinois, U. S. A.

BUYERS, SELLERS, TRADERS

Freight Car Parts (Service-Tested) Cars, Second-hand or Retired
Locomotives, Cranes or Work Equipment
Passenger Train Cars; all types
Relaying Rails
Abandoned Railways & Plants
Machinery and Equipment
Steel Buildings and Structures
Scrap Iron & Steel
"Anything so long as it contains IRON or STEEL"

Use Space

In These

Columns

1936, Compared with March, 1935, for Roads with Annual Operating Revenues Above $25,000,000

Region, road, and year	Number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
New England Region:													
Boston & Albany.....1936	2,289	5,104	7,393	21.0	19,655	1,229	426	17.8	242	19.3	4,765	166	51.2
1935	2,828	3,740	6,568	26.1	21,365	1,265	435	17.8	270	21.8	4,415	161	47.1
Boston & Maine.....1936	8,066	13,465	21,531	11.4	23,259	1,891	705	20.2	309	21.5	3,028	110	36.1
1935	9,004	6,318	15,322	15.0	25,384	1,784	647	19.7	384	28.5	2,926	110	38.4
N. Y., New Hav. & Hartf..1936	13,006	13,652	26,658	17.0	24,808	1,791	648	19.1	274	21.1	3,541	114	51.7
1935	14,672	10,273	24,945	15.3	25,762	1,787	646	19.5	278	21.0	3,390	110	45.7
Great Lakes Region:													
Delaware & Hudson.....1936	9,937	3,008	12,945	3.6	29,085	2,074	979	28.6	532	27.6	7,539	115	34.5
1935	12,375	3,104	15,479	4.5	30,782	2,157	996	29.2	455	24.9	8,051	114	36.9
Del., Lack. & Western....1936	14,554	5,902	20,456	15.8	30,408	1,867	713	21.7	383	26.0	8,018	141	59.6
1935	16,683	4,689	21,372	12.2	31,821	1,919	752	22.6	392	25.9	8,414	139	53.4
Erie (incl. Chi. & Erie)....1936	16,703	14,391	31,094	5.3	40,502	2,443	917	22.1	634	43.6	9,053	106	53.3
1935	24,307	12,841	37,148	6.7	42,367	2,560	980	23.4	560	37.5	9,033	101	49.5
Grand Trunk Western....1936	3,888	7,171	11,059	15.3	30,578	1,599	575	21.6	435	31.7	4,981	110	66.0
1935	4,273	8,219	12,492	16.4	30,985	1,659	557	20.5	351	28.7	4,405	109	58.3
Lehigh Valley 1936	12,159	7,863	20,022	9.3	33,932	1,990	780	23.6	448	29.1	7,285	134	49.7
1935	14,542	4,917	19,459	8.5	34,615	1,915	725	23.2	444	30.3	6,590	141	46.6
New York Central.....1936	104,181	64,195	168,376	18.2	34,255	2,112	847	25.8	441	28.8	7,052	100	67.8
1935	*	*	183,191	18.2	36,853	2,222	922	26.8	422	26.0	6,950	107	62.3
N. Y., Chi. & St. Louis...1936	6,384	7,140	13,524	3.4	35,060	1,997	742	22.4	847	60.0	7,420	100	90.9
1935	9,008	6,966	15,974	3.4	36,847	2,110	816	23.8	738	49.5	7,151	95	77.4
Pere Marquette 1936	8,478	6,510	14,988	4.7	26,090	1,597	598	24.1	477	32.9	3,847	106	93.5
1935	10,817	5,931	16,748	3.2	27,666	1,637	609	24.2	429	30.0	3,479	101	82.2
Pitts. & Lake Erie.....1936	13,709	12,295	26,004	40.3	40,343	3,110	1,638	45.6	140	5.6	15,039	102	31.5
1935	14,191	8,931	23,122	45.2	48,935	3,478	1,889	46.4	189	7.2	19,653	101	35.3
Wabash 1936	10,191	8,957	19,148	4.0	35,177	1,789	611	20.1	576	44.9	4,795	117	65.3
1935	12,122	9,402	21,524	2.8	36,836	1,812	598	19.6	537	44.8	4,779	118	61.5
Central Eastern Region:													
Baltimore & Ohio: 1936	65,001	27,883	92,884	16.8	25,169	2,012	899	30.3	431	22.9	6,293	152	47.1
1935	75,627	20,812	96,439	17.8	27,179	2,115	963	31.5	447	23.3	6,826	151	47.5
Central of New Jersey.....1936	11,012	8,439	19,451	33.6	24,678	2,158	981	30.2	205	11.3	6,384	157	40.4
1935	13,011	7,313	20,324	28.2	28,879	2,379	1,102	32.1	224	12.0	6,825	146	36.8
Chicago & Eastern Illinois.1936	3,379	3,036	6,415	6.6	27,642	1,561	658	27.2	587	34.4	4,202	135	55.7
1935	3,426	2,826	6,252	8.3	28,830	1,657	719	29.4	657	36.5	4,372	126	55.0
Elgin, Joliet & Eastern.....1936	8,338	3,971	12,309	4.9	17,246	2,061	332	37.9	250	11.0	7,094	123	37.3
1935	8,165	3,251	11,416	7.3	17,786	1,991	235	40.0	259	11.0	6,607	118	35.9
Long Island 1936	651	3,486	4,137	2.1	5,642	762	287	28.6	65	4.4	680	325	28.8
1935	763	3,132	3,895	3.9	5,777	749	288	28.2	75	4.9	735	319	26.4
Pennsylvania System 1936	197,709	69,584	267,293	16.1	30,057	2,310	1,004	29.6	337	18.5	9,033	128	48.0
1935	237,437	45,535	282,972	14.6	34,365	2,434	1,094	31.0	345	18.3	9,787	125	46.7
Reading 1936	28,704	12,780	41,484	9.1	23,149	1,936	902	33.4	289	14.4	7,982	156	44.5
1935	33,231	9,633	42,864	7.0	28,355	2,163	1,028	34.5	311	15.2	8,920	141	43.0
Pocahontas Region:													
Chesapeake & Ohio.....1936	43,691	10,515	54,206	1.3	47,961	3,474	1,810	44.0	1,006	42.8	15,518	86	55.2
1935	42,179	11,223	53,402	1.7	52,603	3,795	2,059	46.2	1,149	44.4	18,123	79	53.0
Norfolk & Western.....1936	34,109	5,486	39,595	1.9	46,576	3,234	1,664	42.6	965	39.0	15,762	109	60.7
1935	32,681	4,157	36,838	2.7	49,586	3,385	1,781	44.1	986	38.1	17,090	104	61.2
Southern Region:													
Atlantic Coast Line.....1936	20,199	9,701	29,900	18.9	20,984	1,230	410	18.6	284	25.2	1,655	115	50.5
1935	25,238	8,046	33,284	17.5	21,029	1,250	417	18.4	245	22.4	1,577	113	45.1
Central of Georgia.....1936	3,820	3,273	7,093	6.7	21,306	1,191	458	21.3	541	35.7	2,036	126	70.0
1935	6,350	2,984	9,334	23.5	22,340	1,244	479	20.8	383	25.9	1,897	130	54.4
Illinois Central (incl. Y. 1936	39,014	18,906	57,920	31.7	25,314	1,514	607	25.9	512	32.1	4,690	141	61.3
& M. V.).....1935	41,618	15,176	56,794	34.7	26,863	1,611	686	27.9	560	32.0	4,875	132	52.2
Louisville & Nashville.....1936	39,761	8,802	48,563	22.0	23,550	1,548	703	31.8	523	28.3	4,704	141	64.2
1935	43,321	7,374	50,695	32.7	24,433	1,596	769	33.7	482	23.6	4,900	142	62.0
Seaboard Air Line.....1936	9,542	6,800	16,342	2.2	23,744	1,463	520	20.4	537	39.9	1,996	122	52.5
1935	11,072	5,958	17,030	3.6	23,229	1,446	492	19.6	485	38.3	1,868	123	49.6
Southern 1936	22,237	18,175	40,412	13.8	20,584	1,267	494	21.2	466	32.1	2,929	155	50.7
1935	27,682	15,955	43,637	14.9	21,318	1,303	505	21.8	440	30.7	2,860	152	46.4
Northwestern Region:													
Chicago & North Western..1936	38,054	19,902	57,956	8.0	22,017	1,495	519	21.5	277	20.9	2,148	136	50.0
1935	40,479	19,844	60,323	8.3	23,691	1,559	548	21.5	259	18.9	1,879	116	40.0
Chicago Great Western.....1936	1,664	3,445	5,109	2.7	27,790	1,809	665	22.6	770	54.6	3,607	142	94.6
1935	2,474	2,912	5,386	5.2	32,999	1,786	624	22.0	839	64.7	3,180	134	79.2
Chi., Milw., St. P. & Pac..1936	43,458	18,383	61,841	3.3	25,312	1,677	662	25.4	433	28.1	2,593	130	70.0
1935	50,800	15,522	66,322	2.8	26,571	1,681	666	25.1	390	25.6	2,323	127	61.7
Chi., St. P., Minneap. & Om.1936	3,496	4,813	8,309	8.6	16,384	1,300	526	25.4	393	24.4	2,337	128	55.8
1935	2,112	6,651	8,763	10.7	18,455	1,270	463	21.9	324	22.8	1,764	128	42.1
Great Northern 1936	37,860	11,097	48,957	9.4	27,651	1,951	780	25.2	387	23.9	2,307	132	42.5
1935	42,350	9,307	51,657	8.3	28,482	1,887	744	24.1	312	20.0	1,998	139	37.5
Minneap., St. P. & S. St. M.1936	12,047	4,168	16,215	5.3	19,600	1,285	521	23.6	382	23.9	1,496	113	82.7
1935	13,692	3,131	16,823	6.2	18,080	1,143	434	21.7	291	21.1	1,159	121	74.0
Northern Pacific 1936	27,894	5,206	33,100	12.1	26,994	1,781	772	25.0	479	26.6	2,471	159	54.3
1935	33,863	4,212	38,075	11.4	27,462	1,815	742	23.4	355	22.0	2,136	159	48.8
Central Western Region:													
Alton 1936	2,330	6,457	8,787	24.2	32,081	1,392	502	23.2	363	25.5	3,451	103	63.6
1935	3,269	5,935	9,204	28.2	31,678	1,427	507	24.5	346	25.0	3,415	121	75.5
Atch., Top. & S. Fe (incl. 1936	65,525	12,780	78,305	12.2	31,566	1,668	572	20.2	398	29.6	2,368	125	62.4
G.C. & S.F. & P. & S.F.).1935	75,230	9,797	85,027	13.8	31,134	1,653	545	19.8	320	25.5	2,060	128	54.9
Chicago, Burl. & Quincy...1936	27,984	14,609	42,593	8.4	26,701	1,548	627	24.5	616	41.4	3,014	132	86.1
1935	33,189	11,991	45,180	9.2	27,820	1,555	643	24.7	546	36.1	2,761	128	72.1
Chi., Rock I. & Pac. (incl. 1936	25,037	12,095	37,132	13.0	23,710	1,362	482	21.7	479	36.0	2,297	143	55.7
Chi., Rock I. & Gulf)....1935	31,542	11,150	42,692	20.5	23,748	1,359	460	21.0	382	30.8	1,965	144	49.3
Denv. & Rio Gr. Western..1936	12,924	3,157	16,081	6.2	25,081	1,567	666	25.5	349	19.8	2,105	164	47.1
1935	12,827	2,397	15,224	6.2	25,261	1,627	654	24.9	282	17.7	1,674	163	36.3
Southern Pac.—Pac. Lines.1936	32,966	23,600	56,566	9.7	33,234	2,044	689	21.0	512	38.4	3,354	109	64.9
1935	34,378	23,677	58,055	9.1	33,317	2,076	682	20.4	434	42.6	2,746	109	55.5
Union Pacific† 1936	39,439	16,836	56,275	15.0	38,587	1,877	667	21.3	627	45.4	3,621	129	67.0
1935	43,882	16,458	60,340	18.0	38,138	1,849	678	21.6	571	40.5	3,488	121	63.5
Southwestern Region:													
Mo.-Kans.-Texas Lines 1936	4,682	5,087	9,769	3.2	30,393	1,633	551	20.6	699	56.0	2,053	92	61.2
1935	5,706	2,991	8,697	3.4	29,129	1,593	534	20.5	678	55.4	1,812	84	58.4
Missouri Pacific 1936	15,023	18,618	33,641	3.5	31,830	1,783	656	23.1	699	48.5	3,450	124	73.2
1935	18,803	17,329	36,132	3.5	30,495	1,678	654	24.4	632	40.8	3,196	131	66.3
St. Louis-San Francisco....1936	18,830	7,381	26,211	6.2	24,619	1,312	510	23.7	427	28.7	2,291	140	50.7
1935	21,158	4,647	25,805	7.4	23,784	1,287	487	23.0	384	27.1	1,982	139	43.0
St. Louis Southw. Lines...1936	2,968	2,983	5,951	4.5	31,179	1,691	568	20.0	823	66.2	2,869	93	77.2
1935	3,525	2,978	6,503	7.4	28,440	1,504	481	19.0	658	57.2	2,353	100	74.3
Texas & New Orleans.....1936	7,198	12,561	19,759	7.4	27,783	1,539	542	22.2	497	35.5	2,189	87	60.5
1935	7,479	10,449	17,928	8.5	26,589	1,440	501	21.5	468	34.9	1,906	92	55.8
Texas & Pacific.....1936	2,365	5,213	7,578	3.5	31,007	1,914	609	20.2	774	65.5	2,883	90	42.2
1935	2,981	3,856	6,837	6.4	30,551	1,849	596	20.2	718	60.5	2,585	90	38.8

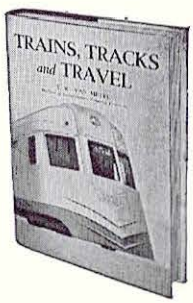
Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Valuable Books for Your Library

New Fourth Edition
Trains, Tracks and Travel

By T. W. VAN METRE

Professor of Transportation, Columbia University



The new edition of this popular book on railroads describes latest practice. There is a complete new chapter on streamlined trains and additions to others covering the new developments in air brakes, air conditioning of passenger cars and in high-speed Diesel and electric locomotives. Among the numerous new illustrations are shown the new streamlined trains. This is an excellent book for a boy who wants to know more about railroads and for the average reader.

Contents

Our Steam Railroads—The Railroad Track—The Steam Locomotive—Electric Locomotives; Gasoline and Oil Motors—Freight Cars—Passenger Train Cars—Tomorrow's Trains Become Today's—Passenger Stations and Terminals—The Operation of Trains.

1936. 4th. 312 pages, 276 illus., 7 x 9½ in., cloth, $3.00

Analysis of Railroad Operations

By J. L. WHITE

Formerly Assistant Comptroller, United States Railroad Administration; Director, Section of Transportation Service—Federal Co-ordinator of Transportation

Without going into the details of accounting procedure, Mr. White clearly explains the accepted method of analyzing and interpreting railroad statistical data. He describes how the figures produced in accounting departments should be used in the study of railroad operating results; how these figures reflect the various activities of the railroad and its efficient or inefficient operation as a whole or in any of its departments.

Classifications of the Interstate Commerce Commission are shown in full and frequent references are made to them in the main text.

1925. 391 pages, forms, index, work sheet, and the Jan. 1, 1935, order of the I. C. C., 6 x 9 inches, cloth. $4.00

SIMMONS-BOARDMAN

FREE EXAMINATION COUPON

SIMMONS-BOARDMAN PUBLISHING CO.

30 CHURCH STREET, NEW YORK, N. Y.

Please send prepaid for ten days' free examination the books checked below. If satisfactory I will remit the list price. Otherwise I will return the books without obligation.

( ) Trains, Tracks and Travel
( ) Analysis of Railroad Operations
( ) Who's Who in Railroading
( ) United States Safety Appliances
( ) When Railroads Were New
( ) Transportation Glossary

Name .....

Address .....

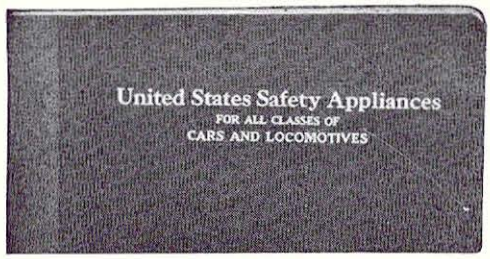
City .....

State .....

Company .....

Position .....

(This offer is limited to the United States and Canada) R. A. 7-25-36



United States Safety Appliances

(A. A. R. Edition)

The 14th edition of this book contains all the new laws, I. C. C. rulings and A. A. R. specifications since the last edition in 1928. More than 250,000 of these books have been sold.

1935. 121 pages, 49 drawings, 7½ x 3¾, imitation leather, $1.00

When Railroads Were New

By CHARLES FREDERICK CARTER

A fascinating human interest story of the early American and Canadian railroads and of the men who built and ran them. The author, an old railroad man, tells of the beginnings of the Erie, the Pennsylvania, the Baltimore and Ohio, the New York Central, the first Pacific railroad, the Santa Fe, the Rio Grande, the Canadian Pacific and other lines. It is illustrated with reproduction of wood cuts of early locomotives and railroad scenes.

1926. 4th (Centenary). 338 pages, 17 illustrations, 6 x 9 inches, cloth. $2.50

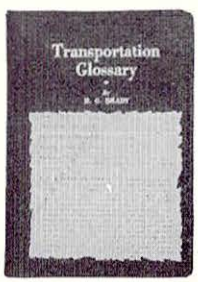
Who's Who in Railroading

The 9th Edition of what was formerly the "Biographical Directory of Railway Officials of America" is based upon a complete resurvey of the field by means of original questionnaires. Biographical sketches of some 4,000 railroad officials, equipment manufacturers, economists, members of regulatory commissions and others whose work is directly connected with the railroad industry of North America are presented. The descriptions of these leaders of the rail industry include personal information, such as their family connections and social, religious and political affiliations, as well as a complete outline of their professional careers.

1930. 579 pages, 6 x 9 x 1⅝ inches, cloth. $3.00

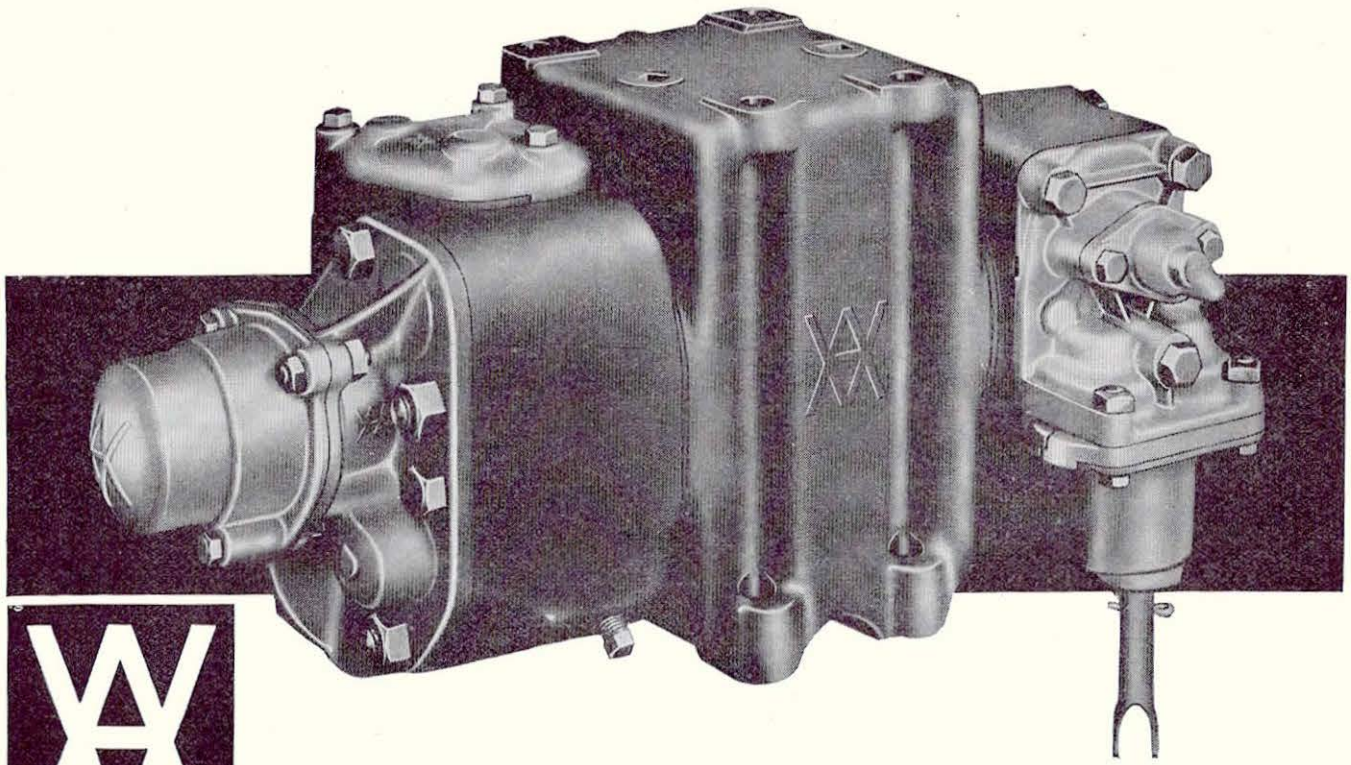
Transportation Glossary

By H. G. BRADY



Technical and semi-technical terms, phrases and expressions in more common use in railway, highway, air and marine transportation, and in port traffic are concisely defined in this handy reference book. Ordinary dictionaries, thesauri and law book sources furnish little information on transportation terms and this book fills a long felt need. It is printed in large clear type and cross references facilitate quick tracing of desired information.

1929. 119 pages, 5 x 7 inches, flexible. $1.75



The "AB" Brake has Proved its Merits

Recognition of a problematic situation . . . Development of a practical means for solution . . . Realization of the anticipated advantages—this is the sequence through which every worthwhile achievement has progressed.

More stringent and exacting operating conditions demanded a freight brake of greater effectiveness and efficiency . . . The Westinghouse "AB" Equipment was developed to embody the predetermined characteristics . . . Extensive service results have amply demonstrated the merits of this brake in meeting present-day requirements.

WESTINGHOUSE AIR BRAKE CO.

GENERAL OFFICE AND WORKS . . . WILMERDING, PA.

MAGNUS COMPANY

(INCORPORATED)

Journal Bearings

AND

Bronze Engine Castings

New York Chicago

PANTASOTE and AGASOTE

Are the Outstanding Favorites

on the New

STREAMLINED TRAINS

FOR more than 40 years Agasote and Pantasote have demonstrated their utility, durability and economy by rendering eminently satisfactory service in passenger equipment. It was but logical, therefore, that these two superior materials should have been selected for the 1300 new Eighth Avenue subway cars and used on practically all the new streamlined trains.

THE PANTASOTE CO., Inc.

250 Park Avenue, New York City

683 Atlantic Ave. BOSTON
751 Monadnock Bldg. SAN FRANCISCO
1355 Peachtree St., N. E. ATLANTA, GA.
1402 Lyons Ave. HOUSTON
Peoples Gas Bldg. CHICAGO

Selling Agents for

THE PANTASOTE LEATHER CO.
PASSAIC, N. J.

and

THE AGASOTE MILLBOARD CO.
TRENTON, N. J.
(In the Railroad & Marine Field)

GET TOGETHER DEPARTMENT

EDUCATIONAL

THE Railway Educational Bureau, Omaha, Neb., offers a distinctive education service for Supervisors and other employees. Write for FREE Special Bulletin.

FOR SALE

STEEL DUMP CARS
Air Operated
EIGHT—20-yd. WESTERN, built 1929
THREE — 30-yd. CLARK, built 1923
TEN — 10-yd. WESTERN, built 1927
In unusually good condition
Iron & Steel Products, Inc.
Railway Exchange Chicago
"Anything so long as it contains Iron or Steel"

FOR SALE

1000 car sets 70-ton ANDREWS full "U" Truck Frames. Cheap. Also, Trucks complete.

Iron & Steel Products, Inc.
Railway Exchange Chicago

FOR SALE

BETTENDORF U TYPE CAST STEEL 30 TON SIDE FRAMES

These side frames are in unusually good condition, and can be purchased at a very attractive price. All kinds of reclaimed, reconditioned Freight Car Parts—Storage Tanks—Send Us Your Inquiries—

ERMAN - HOWELL & CO., INC.,
332 So. Michigan Ave., Chicago, Ill.

VAPOR Products

STEAM COUPLERS ARA Standard
VAPOR SYSTEM Thermostatic Control
FLEXIBLE CONDUITS In place of Steam Hose
CONTROLS for Air Conditioning

VAPOR CAR HEATING CO., Inc.
RAILWAY EXCHANGE, CHICAGO

IRON & STEEL PRODUCTS, Inc.

Railway Exchange
Chicago, Illinois, U. S. A.

BUYERS, SELLERS, TRADERS

Freight Car Parts (Service-Tested)
Cars, Second-hand or Retired
Locomotives, Cranes or Work Equipment
Passenger Train Cars; all types
Relaying Rails
Abandoned Railways & Plants
Machinery and Equipment
Steel Buildings and Structures
Scrap Iron & Steel
"Anything so long as it contains IRON or STEEL"

Use Space

In These

Columns

National Transportation Considered as a Single Unified Problem

A NATIONAL TRANSPORTATION POLICY

by C. S. Duncan

Economist of the Association of American Railroads

This important volume presents a complete picture of the issues involved in planning a truly national policy for railroads, highways, waterways, pipelines and airways in a single transportation system. Costs, rates, service, surplus facilities, regulation, taxation, safety, dependability and public usefulness are considered as well as the conclusions resulting from years of study of the methods in use in foreign countries. Provides indispensable, authentic information for all phases of this great problem. At all booksellers. $3.00.

D. APPLETON-CENTURY COMPANY
35 West 32nd Street, New York

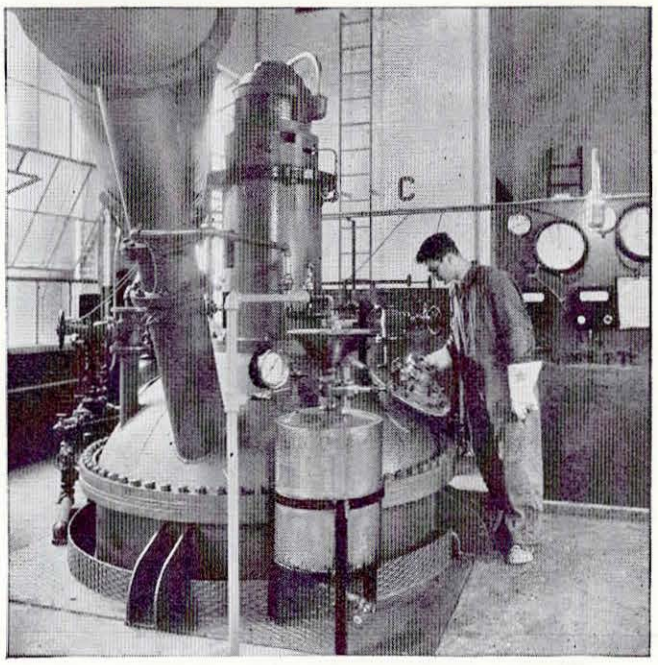
From the Early Period
of the Telegraph to the present
remarkable development in the field of Electricity

KERITE

has been continuously demonstrating the fact that it is the most reliable and permanent insulation known

THE KERITE INSULATED WIRE & CABLE COMPANY INC
NEW YORK CHICAGO SAN FRANCISCO

WHY do Bakelite Resins Lengthen Paint Life?



Large precision stills, like this, make the production of Bakelite Resins an exact science insuring uniform results

THE BASIC REASON is that Bakelite Blending Resins are products of chemical research, developed for the specific purpose of increasing paint and varnish integrity — not merely adapted to this use. As a result, they possess uniform and measurable resistance to the factors that cause most paint failures: sunlight, oxygen, fumes, brine, moisture, chemicals and temperature changes.

When correctly formulated in protective coatings, Bakelite Synthetic Resins impart much of this same durability and uniformity to the film. They contribute lasting toughness and elasticity, added moisture-proofness and increased weathering ability. In addition, they provide quick-drying without sacrifice of durability.

A growing number of the improved modern coatings supplied to the railroad industry are based on Bakelite Resins. Leading paint and varnish manufacturers now formulate anti-corrosive primers, metal paints for bridges and tank cars, passenger car varnish and enamel and numerous other high integrity finishes with these more durable resins. Ask your paint suppliers about them, and write for our booklet 24S, "Bakelite Synthetic Resins".

BAKELITE CORPORATION, 247 Park Avenue, New York
BAKELITE CORPORATION OF CANADA, LTD., 163 Dufferin Street, Toronto

BAKELITE
REGISTERED U. S. PAT. OFF.

The registered trade marks shown above distinguish materials manufactured by Bakelite Corporation. Under the capital "B" in the numerical sign for infinity, or unlimited quantity, it symbolizes the infinite number of present and future uses of Bakelite Corporation's products.

SYNTHETIC RESINS

Index to Advertisers

July 25, 1936

A

Agasote Millboard Co., The 24
Alan Wood Steel Company 7
American Arch Company 17
American Bridge Co. 9
American Hair & Felt Co. 6
American Steel Foundries 5
Appleton-Century Co., D. 25

B

Bakelite Corporation 25
Bendix-Westinghouse Automotive Air Brake Co. 10
Bethlehem Steel Company 3

C

Chase & Co., Inc., L. C. 8, 12
Classified Advertisements 24
Columbia Steel Company 9, 9b

D

du Pont de Nemours & Co., Inc., E. I. 4
Dry-Zero Corporation 6

E

Edgewater Steel Co. 26
Electro-Motive Corporation ..... Front Cover
Erman-Howell & Co., Inc. 24

F

[illegible]y Co., Inc. 16

G

General Railway Signal Co. ..... Back Cover
Get Together Dept. 24
Gold Car Heating & Lighting Co. 26

H

Harbison-Walker Refractories Co. 17
Hunt-Spiller Mfg. Corp. 29

I

Iron & Steel Products, Inc. 24

K

Kerite Insulated Wire & Cable Co., Inc. 25

L

Lima Locomotive Works, Inc. 15

M

Magnus Co., Inc. 24
Montreal Locomotive Works, Limited 19, 20

N

National Bearing Metals Corp. 26
National Malleable & Steel Castings Co. 2
National Tube Co. 9b

O

Ohio Locomotive Crane Co., The 26

P

Pantasote Co., Inc., The 24
Pantasote Leather Co., The 24

R

Railway Educational Bureau 24
Republic Steel Corp. 14

S

Superheater Company, The 18
Simmons-Boardman Pub. Co. 22

U

Union Switch & Signal Co. ..... 21, Back Cover
U. S. Steel Products Co. 9, 9b
U. S. Steel Corp. Subsidiaries 9, 9b

V

Vapor Car Heating Co., Inc. 24

W

Waugh Equipment Company 9a
Westinghouse Air Brake Co. 23

Y

Youngstown Sheet and Tube Co., The 11

LOCOMOTIVE CRANES
CRAWLER CRANES
SHOVELS
OHIO
THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS OHIO

EDGEWATER STEEL COMPANY
PITTSBURGH, PA.
Details of our products appeared in the following issues of *Railway Age* during 1934, 1935, 1936:
1935—Jan. 5, 26—Feb. 2, 16—March 16—April 6—May 11—June 15, 22, 29—July 20, 27—Aug. 24—Oct. 5—Nov. 2—Dec. 7, 21
1936—Jan. 4—Feb. 1, 15—March 7, 21—April 4, 18—May 2—June 6, 20, 27

"Arctic" #36 BRONZE
CAR JOURNAL BEARINGS
LONG WEAR

NO TROUBLE
NATIONAL BEARING METALS CORP.
ST. LOUIS, MO.
New York, N. Y. Jersey City, N. J. Pittsburgh, Pa. Meadville, Pa. Portsmouth, Va. St. Paul, Minn.
2

Steam *and* Electric Specialties *for* Passenger Car Heating
GOLD CAR HEATING & LIGHTING CO.
NEW YORK

If you are looking for a position or in need of a man put your advertisement in the Get Together Department

BIG Savings in the SHOP

DUE to perfect uniformity, HUNT-SPILLER *Air Furnace* GUN IRON Castings are made very close to finished sizes.

This feature alone offers tremendous savings to the railroads. Excess metal which has to be machined is wasteful of time and material.

And naturally because of their uniformity H S G I Castings are free from sand holes and hard spots. This permits the use of maximum speeds and feeds without any danger of tool breakage.

The savings in machining costs plus the economies effected after application insure a big return from every investment in HUNT-SPILLER *Air Furnace* GUN IRON.

H S G I
Reg. U. S. Trade Mark
Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings

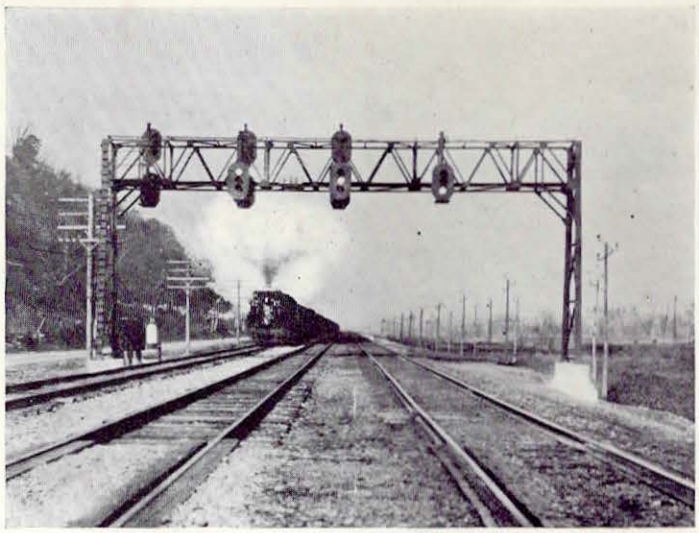
Parts Finished For Application

Dunbar Sectional Type Packing
Duplex Sectional Type Packing
for Cylinders and Valves
(Duplex Springs for Above
Sectional Packing)
Cylinder Snap Rings
Valve Rings All Sha[illegible]

HUNT-SPILLER MFG. CORPORATION
J. G. Platt Pres. & Gen. Mgr. / \ V. W. Ellet Vice-President

Office & Works
383 Dorchester Ave. South Boston, Mass.
Canadian Representative: Joseph Robb & Co., Ltd., 5575 Cote, St. Paul Rd., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HUNT-SPILLER *Air Furnace* GUN IRON



TRAIN OPERATION BY SIGNAL INDICATION

In 1923 a southern railway equipped a 28-mile double-track section for train operation by signal indication without train orders, with the two tracks signaled for operation in both directions. In a study of the efficiency and economics of this installation, the Committee on Railway Signal Economics included the following in its 1925 report to the A.R.A. Signal Section:

"Savings Made by Elimination of Train Orders

"In October, 1920, 102 passenger orders and forty-two freight orders were issued for trains moving against the current of traffic.

"In October, 1924, 148 passenger trains and sixty-six freight trains were diverted without orders, or a saving for the twelve months of 346 train hours. At $18 per train hour, the saving amounts to $6,228 per year. The cost of the signaling and traffic locking was approximately $18,000. The return upon the investment is therefore 34.6 per cent. per year, *without taking any credit for the increased safety of operation and delays eliminated by keeping the trains moving in the direction of traffic.*"

Directing train movements by signal indication at the time and place the order is to be executed is *the* safe, expedient, and economic method of operation.

UNION SWITCH & SIGNAL COMPANY
Swissvale, Pennsylvania

GENERAL RAILWAY SIGNAL COMPANY
Rochester, N. Y.

157

HISTORY IN THE MAKING

Train movements were first directed by signal indication on this railroad in 1912. Now 1,478 miles of track or 36% of the total mileage is equipped for train operation by signal indication without train orders.